ELECTRICAL REVIEW

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EDITORIAL, ADVERTISING & PUBLISHING OFFICES: Dorset House, Stamford St., London, S.E.1. Telegraphic Address: "Elecrev, Sedist, London." Code: ABC. Telephone No.: Waterloo 3333 (60 lines). Annual Subscription: Great Britain and elsewhere £3 0s. 0d. Cheques and Postal Orders (on Chief Office, London) to be made payable to ELECTRICAL REVIEW, and crossed "Lloyds Bank." Entered as Second Class Matter at the New York, U.S.A., Post Office.

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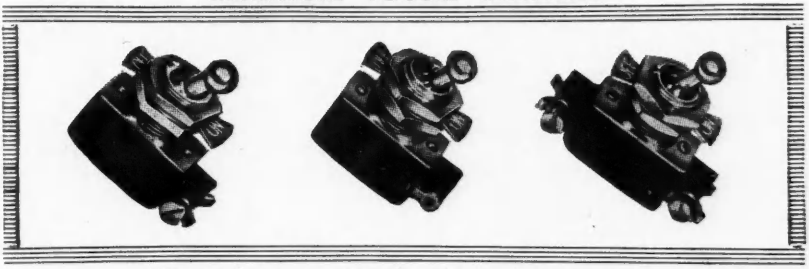

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ELECTRICAL REVIEW

THE OLDEST ELECTRICAL PAPER

ESTABLISHED 1872

Vol. CXLIV. No. 3718
25th FEBRUARY, 1949

The Proving House

SHOULD IT UNDERTAKE RECONDITIONING?

WHAT appears to have been the first local attempt to test samples of accessories and fittings with the object of certifying their compliance with an acceptable standard of excellence was described in an I.E.E. paper of 1899. The considerable success of that effort prompted proposals to set up a National Electrical Proving House, opposed initially though favourably received later, which culminated in the submission of a scheme in 1917: but nothing was done.

Thirty-two years afterwards there has come into being an E.D.A.-B.S.I. organization which, although functioning in a very modest way by comparison with that contemplated at the time of the I.E.E. reconstitution, is nevertheless to be encouraged as a beginning, for the public at large does really need to be protected against equipment that is inherently unsafe or is potentially dangerous. Testing with a view to approval for this purpose may properly be done centrally.

Safety and Efficiency

But classification according to degrees of "goodness" cannot be upheld because it would be misunderstood and misinterpreted. Neither should testing for safety of necessity include any assessment of operational efficiency, which would restrict the purchaser's freedom of choice. Yet there is occasional need for an instrument to be independently calibrated; for the efficiency of a new device to be certified; or for technical advice on the practical utility of an idea, which cannot properly be given without regard for safety. The smaller manufacturer at present has no alternative to the N.P.L.

All guidance of that kind might well be centralized, but technical efficiency is not the only, or in many cases the primary, reason why many household electrical appliances are popular. Utility value in particular circumstance is important and there is fashion, too, another constantly changing factor but often useful to revive flagging trade.

Decentralization an Advantage

A single testing centre would, apart from safety considerations, tend to stereotype design and eventually to become dictatorial. An appliance that is suitable for sale or hire in one area may not be appropriate to another, or even acceptable in all parts of the same area. There must be decentralization if local and sectional interests are to be encouraged, and transport problems alone will prohibit servicing from too few centres.

Consumers will now hope for more uniformity in servicing and for the reconditioning of appliances to some consistent standard. It is to be hoped that the reconditioning depots will not keep to themselves the weaknesses of design and practical awkwardnesses they will find in consumers' appliances. Here will be an unrivalled opportunity for constructive criticism for the benefit of the manufacturing side of the industry.

What the manufacturer will fear most is that he may remain ignorant of the reasons why his products fail to secure

approval. If purchasing officers are to be guided by advice (directive!) on "suitability" from the testing centres, will any other consideration than price for quantity be left to them? A choice of that kind is not often the most economic. One can buy cheaply at frequent intervals or, as Mr. H. Hobbins seemed to prefer in his recent I.E.E. paper, purchase better-made appliances and make them last longer by reconditioning. Adoption of this policy will mean a progressively increasing volume of reconditioning work. How is it to be confined to manageable proportions? Mr. Hobbins states that 34,000 kWh will be expended on the single operation of removing grease from 4,000 cookers each year in one depot alone! The author may be right in believing that the average consumer will clean her own possessions more carefully than equipment which is hired, but it is doubtful whether long-term hire purchase will be an effective compromise. No housewife will like to be left with an outmoded model.

ELECTRICAL BENEVOLENCE

A GOOD deal more money is needed by the Electrical Industries Benevolent Association if it is to cope adequately with the increasing demands upon its services. It was suggested recently that regular subscribers might consider doubling their contributions and up to date about sixty companies and associations formerly providing £5 or over have answered the call, raising the aggregate of them all from £2,600 to £5,200. Although the list includes many of the leading concerns in the industry there are still some whose decision has not yet been made. We hope to report further progress soon.

NATIONALIZATION AND COMPENSATION

THERE has been some complaint about the delay in the appearance of the compensation regulations under Section 55 of the Electricity Act, 1947. They have now been placed before Parliament in final draft form for approval, and the draft is obtainable from the Stationery Office (see page 324. The result of the eighteen months' negotiations on the subject appears to be a reasonable compromise. Some may regard it a weakness of the Regulations that the Electricity Boards are the assessors of the amount of compensation due to a claimant, but the Boards may be required by claimants to review their assessments and referees are to be appointed to consider appeals.

TENDERING PERIODS

WE recently referred to complaints by electrical contractors of the brevity of the time between an invitation to tender and the closing date. Some success has attended the voicing of this grievance. In two districts at least—Birmingham and Hull—the responsible authorities have undertaken to endeavour to remedy the trouble.

CONTRACTORS AND BOARDS

So far the discussions and negotiations between the Electricity Boards and the electrical contractors have not resulted in an agreement, so far as we can ascertain, but there is evidently a desire on the part of some of the Boards, if not all, to work amicably. Recently Mr. G. T. Allcock, Edinburgh manager of the South-East Scotland Board, assured Scottish contractors that it was his intention to compete with them but not to run any sort of subsidized competition. Similar sentiments were expressed by Mr. D. H. Kendon, deputy chairman of the Midlands Board. He said that competition would be keen but it would be fair. Contractors may regret that the Boards think it necessary to compete with them, but they cannot expect more than this.

TURBINE JOURNALS

THE lubricating oil in the bearing journals of steam turbines in ships is liable to contamination with sea water, which causes corrosion. Power station plant is not normally exposed to this risk. It is, nevertheless, useful to know that salt water damage in similar accidental circumstances can be prevented, or corrosion which has already started can be arrested, by the use of a water-miscible inhibitor consisting of sodium nitrate solution circulated with the oil pending an opportunity to cleanse the lubricating system. Practical trials at sea, described by Mr. S. E. Bowrey (Royal Naval Scientific Service) in a paper presented to the Institute of Marine Engineers, have indicated the effectiveness of this method of protection.

Automatic Electro-Plating

UNIFORM TREATMENT OF LARGE QUANTITIES

THE basic principles of electro-plating are well known as generally carried out in manually operated still vats and in revolving barrels. More recently developed plating equipment possesses the less familiar advantages of fully automatic operation whereby each article receives identical treatment, so that a uniformly high standard of deposition is consistently obtained, together with a continuous output at full capacity. The minimum of floor space is occupied and there is a considerable saving in labour cost. With most plants of this nature two operators are required, one to load and the other to unload the racks of articles; only one operator is needed for rotary plant.

There are two main kinds of automatic equipment. In the "straight through" type the whole series of processing tanks follow one another in a straight line, whereas the "roundabout" type has tanks arranged in an elliptical or horse-shoe formation. In both systems the articles are placed on insulated jigs (i.e., cathode suspenders) the insulating covering of which consists of a chemically resistant plastic material such as polyvinyl chloride. It is continuous from the hooks downward, except at the points of contact with the articles, its purpose being to prevent waste of current and metal by needless deposition on the jig stems and frames. The jigs carrying the articles are loaded on to the flight bars by the operator and are conveyed mechanically through the whole sequence of operations from start to finish, including the preliminary cleaning processes and the various dips and swills.

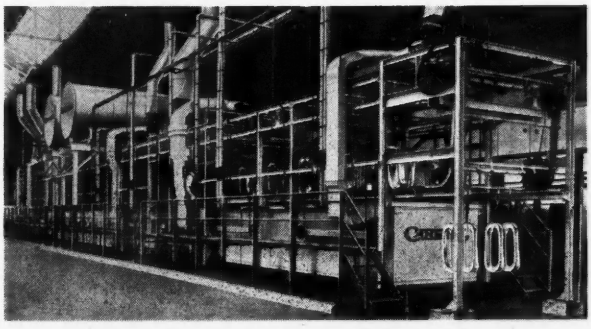


Fig. 1.—"Straight through" nickel and chrome plating plant at the works of the Standard Motor Co., Ltd., Coventry

Some plating processes consist of a considerable number of operations; for instance, in nickel and chrome plating zinc alloy diecastings not fewer than sixteen different operations are involved. First the articles undergo electrolytic cleaning in a hot alkaline solution, thence through a warm swill into a dilute acid dip, followed by a further rinse, cyanide dip and the subsequent electro-deposition of copper. From the copper vat the articles pass through another cold water swill, then through a dilute acid dip, a further swill and thence to the bright nickel vat where they receive a substantial coating of metal. When nickelled, the articles are swilled and transferred to the chrome solution, after which they pass through further swills and neutralizing dips before receiving a final rinse in boiling water, which ensures that they dry spontaneously in air before being unloaded.

In automatic plants the actual processes vary with the nature of the base metal, the type of article and the metal to be deposited. The relative time of immersion in each solution is governed by the lengths of the tanks and provision is generally made for varying the speed of the conveyor to enable the operator to adjust his plating times according to the thickness of deposit specified.

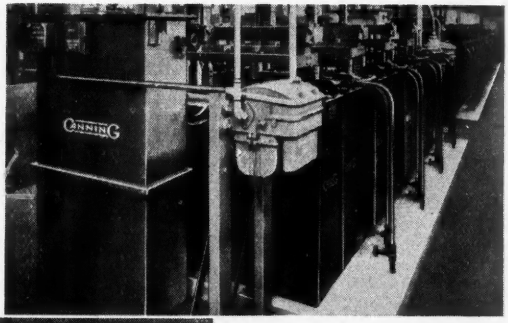
It will be evident that automatic operation offers considerable advantages over manually operated plant, the quality of the finish and adhesion of the deposit in

the latter case being largely dependent upon the care and skill of the operator. For plating large quantities of repetition parts, automatic equipment is now almost indispensable in order to cope with the output and ensure a continuous flow of work through the shop. More than fifty automatic electro-plating installations manufactured by W. Canning & Co., Ltd., are in use at the present time, but many further variations are possible.

The most recently developed "straight through" plant for bright nickel and chrome deposition (Fig. 1) is engaged in plating automobile radiator shells and wheel discs. The highly polished articles are loaded on to the conveyor at the far end and the plated shells are shown emerging from the plant at the right of the picture. The original brilliancy of the metal is retained throughout the whole process and no buffing of the plated articles is required, the parts being ready for assembly when removed from the line.

It will be noticed that the conveyor mechanism is carried by a structural steel framework and that motor-driven lifting gear is placed at intervals to raise the flight bars and articles clear of the tanks when it is necessary to transfer the work from one solution or swill to another. An exhaust system removes steam arising from the hot water rinses and the very fine spray thrown up from the surface of the cleaners and plating baths when they are in operation. There are pumps and filter presses for continuous air agitation, circulation and filtration of the bright nickel solution.

Periodically the solution is pumped into overhead storage tanks to enable the operator to inspect and clean out the plating vat. The raised platform along the whole length of the plant on either side permits a clear view across the various processing tanks and an inspection bay allows the plater to examine the nickelled articles at intervals before they enter the bright chrome solution and thus to satisfy himself that the deposit has the desired brilliancy.



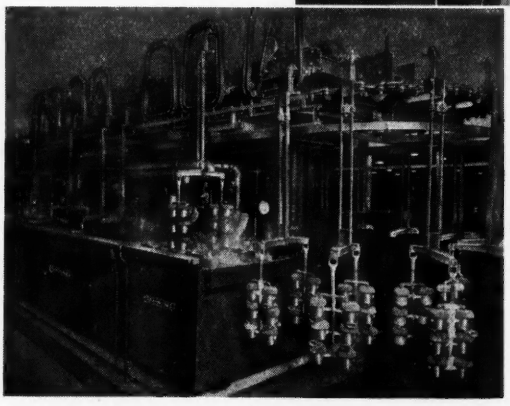
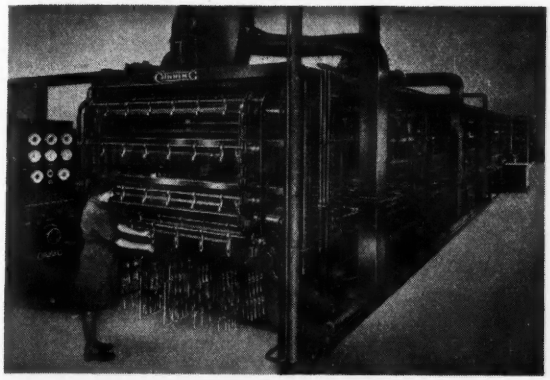


Fig. 2.—These oil-immersed selenium rectifiers supply 27,000 A d.c. to the plant in Fig. 1

Fig. 3.—Tin-plating the pistons for Vauxhall motor cars on a "roundabout" plant

The banks of oil-immersed selenium plate rectifiers (Fig. 2) which provide low voltage current for the plant described above have a total output of 27,000 A. Motor-generators are sometimes used as an alternative to rectifiers, being equally reliable but requiring a little more attention and upkeep.

In the automatic "roundabout" depicted (Fig. 3) the jigs of articles are carried by an endless chain conveyor through the various operations in tanks arranged in a horseshoe formation. A



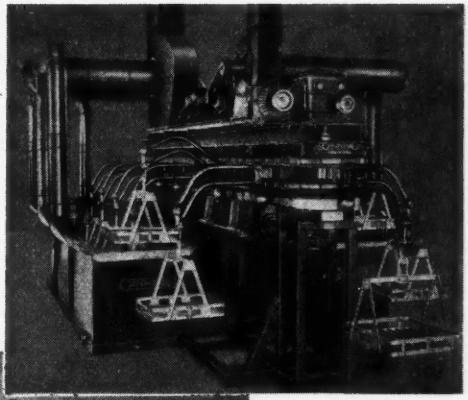
positing silver, a plating process that is generally carried out in manually operated vats and demands very thorough preparation of the surface of the metal. The speed of the conveyor can be varied according to the weight of silver required upon the articles. and is controlled by means of the handwheel shown on the lower portion of the panel left of the operator.

Fig. 4.—Silver-plating cutlery at Elkingtons, Birmingham

feature of this plant is the "banjo" lifting mechanism fitted to a structural steel framework above the vats and operated through gear boxes from a central overhead shaft driven by a single motor. This particular plant is used for tin-plating pistons, but if so desired it could easily be employed for depositing other metals on different articles. The temperature of the solution in the first tank is thermostatically controlled (see device connected to the dial type thermometer) and the tops of the pistons are protected by rubber caps to confine deposition to the outside walls where it is required.

Another plant (Fig. 4) is interesting as one of the few automatic installations used for de-

A unit embodying an extension of the automatic principle to barrel plating of nuts, bolts and other small articles (see Fig. 5) has been in operation for several years and is capable of dealing with a



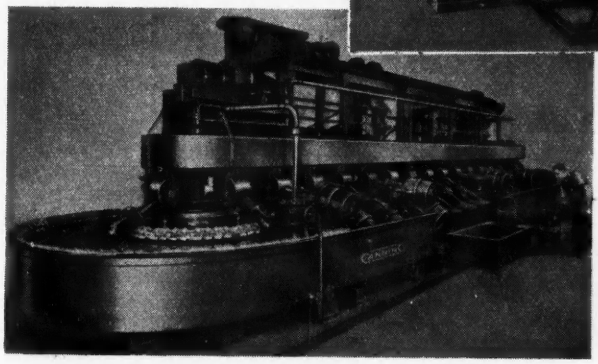


Fig. 5.—Automatic barrelling plant for zinc plating nuts, screws and other small parts

Fig. 6.—Automatic pickling plant for general work

big output of work.

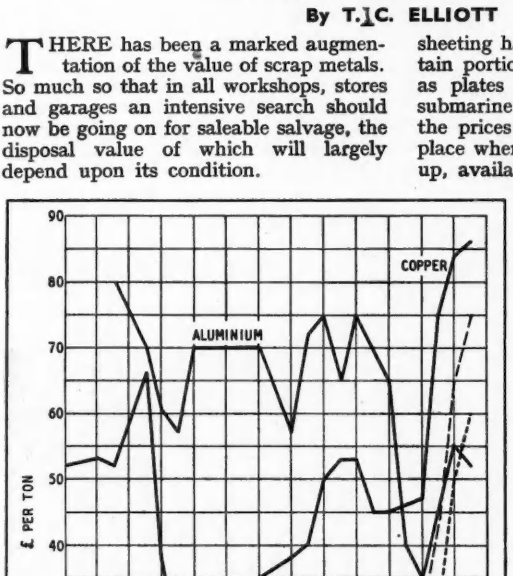
The last illustration (Fig. 6) is not, strictly speaking, of electro-plating plant but of the automatic conveyance of articles through a

series of processing tanks, in this case acid pickling and subsequent rinses. The conveyor gear is of the cam-operated arm type, chain driven by a motor through a high reduction gear box. The carriers for the articles are made of acid resistant material and are lifted mechanically in and out of each tank in sequence, returning finally to the loading position shown in the foreground. An exhaust system carries away the steam and acid fumes.

Scrap Metal Prices

By T. C. ELLIOTT

THERE has been a marked augmentation of the value of scrap metals. So much so that in all workshops, stores and garages an intensive search should now be going on for saleable salvage, the disposal value of which will largely depend upon its condition.



Scrap metal prices, 1924 to 1949

Clean cuttings of aluminium are much more valuable than discarded, or used, pieces and turnings. Similarly heavy copper stands at a higher figure than copper wire, some of which may be coated with rubber insulation. Lead sheeting has a good value as well as certain portions of worn-out batteries, such as plates from large accumulators and submarine cells. Other factors governing the prices offered are, for instance, the place where the material is to be picked up, available means of loading and cost of transport. Very often suitable containers are not available, or can be obtained only at high cost. Finally, as a cause of price variations, there is not a universal basic rating among scrap metal merchants as there is in the case of dealings in the new raw materials.

Thus it is that the scrap value curves of four metals covering a period of the last 15 years are plotted on the higher average scale to be comparable throughout. As a general guide to price trends these curves can be useful and may give some workshop superintendents cause to think —and act.

Mention can be made of a scrap substance frequently encountered in the electrical industry of which lead is the basic component. It is the mixture of PbO_2, $PbSO_4$ and H_2SO_4 commonly called sediment, or accumulator sludge. Not so many years ago, when its selling price was very low, the cost of collection was much too heavy in comparison as well as the purchase of special carrying containers. It frequently happened that the stuff was interred in an obscure corner of the grounds, with misgivings. Nowadays this sludge will readily bring in twenty shillings per cwt.

Recent press reports following on the investigations of the Economic Co-operative Administration state that quantities of scrap lead and aluminium have been purchased from Continental countries for shipment to the United States via English refining mills. Such world-wide transactions in the inverse direction must tend to fluctuations in values.

The root cause is the shortage of the basic raw materials, as is disclosed in the E.C.A. Report on Non-Ferrous Metals, 1949-1950 Programme:—

"The world shortage of supplies of copper, as of lead and zinc ores, will make it difficult to carry out in full the 1949-50 programme. The import requirements for copper of the participating countries from the outside world amount to 422,000 tons. It is believed that these requirements are likely to exceed the supplies available by perhaps 40,000 tons (equivalent to $20 million). Similarly it is expected that import requirements of lead and zinc ores may exceed available supplies by about 70,000 tons of lead and 120,000 tons of zinc. These shortfalls can be made good by additional imports of refined metal, which come only from the Western Hemisphere. Such substitutions would, however, increase dollar imports by about $29 million."

Television Explained to the Layman

FARADAY LECTURE BY SIR NOEL ASHBRIDGE

THE free public Faraday Lecture, which is arranged annually by the Institution of Electrical Engineers, was delivered in the Central Hall, Westminster, last week, by Sir Noel Ashbridge (past-president, I.E.E., and deputy director-general, B.B.C.), who demonstrated before a large audience how modern television has been evolved from the simplest form of electrical communication. The subject was particularly interesting to many people because of the proposed expansion of the B.B.C.'s television service, starting with the completion of the Sutton Coldfield station near Birmingham this year. In view of the extreme complexity of modern television only a broad outline of the subject was presented, but with the aid of an excellent series of demonstrations Sir Noel succeeded in conveying the basic principles of operation to a non-technical audience in a very effective way.

Sequence of Development

He commenced by tracing the development of communication from the simple electric bell, through morse and the printing telegraph, to the wireless telephone and sound broadcasting and thence to television.

Demonstrations were then given to indicate the advances made in the rapid transmission of intelligence by radio and the difference between good and bad sound broadcasting. The latter was achieved by reproducing the recorded voice of a well-known B.B.C. announcer by means of amplifiers with different audio-frequency bandwidths. This clearly indicated that the wider the bandwidth employed for transmission, the higher the quality of reproduction attainable.

Improved Mobile Equipment

In order to demonstrate the system of television used by the B.B.C., the latest mobile outside broadcast equipment, complete with a team of operators, was present so that actual pictures could be seen. This equipment uses the new cathode potential stabilized tube, the sensitivity of which is greater than that of other types previously used for outside broadcasts. It is of unit construction, comprising three camera channels each of which is provided with monitoring and fading equipment. Normally the whole of the apparatus is carried in trucks, but for theatre work and in places where access is difficult, the units can be removed from the trucks and reassembled inside the theatre.

During the lecture television cameras were used to enable some of the demonstrations to be seen on the screens of televisors placed amongst the audience, thus giving a closer view of many things which otherwise would have been too distant. Models were also shown to demonstrate the basic principles on which camera tubes work and how the picture is reconstructed after transmission by a rapidly moving spot of light.

Views on the News

By REFLECTOR

AS I mentioned last week, certain Scottish towns seem to have been harder hit by recent electricity price increases than most others—or Scotland may be more vocal. At all events, the Scottish Labour M.P.s met Mr. Gaitskell last week in the hope that he would do something about it. The Minister was sympathetic enough, but tried to justify the winter surcharge. He expressed the view (which few consumers seem to hold) that the effect of the surcharge would be cancelled out by the rebates to be granted during the other three quarters. He was also optimistic enough to think that the surcharge had reduced the maximum demand, a contention hard to prove in view of the mild weather we have had. His only suggestion for the mitigation of the additional cost burden was that the Area Boards might consider collecting their bills in instalments.

★ ★ ★

Red type was generally used by the Electricity Boards in announcing to consumers the imposition of the winter surcharge. Therefore it is psychologically correct to employ green type to inform them of the subsequent summer rebate. This is being done by the South Western Electricity Board. Consumers' co-operation in reducing the peak is "gratefully acknowledged" and they are urged to continue their good work but to take full advantage of the service outside peak hours.

★ ★ ★

Inhabitants of beauty spots often hold different views from those who pay occasional visits. For instance, recently a correspondent of the *Manchester Guardian* put in a word for the Welsh. She said that the Welsh were so "spiritually sick" that, like Switzerland and Scotland, they welcomed hydro-electric power at whatever cost to their valleys. "We are so degenerate as to prefer the material prosperity of our farmers, the increase of Welsh industry, including our decimated woollen mills and the growth of Welsh tourist trade (attracted as much by comfort as by panoramas), to the dry slopes of our mountains."

Beauty lies in the eyes of the beholder. In other words, concrete towers may please some people and not others. Many protests have been heard against proposals to erect cooling towers in various parts of the country, but in Scotland concrete towers of another sort and shape are to be erected to preserve the "amenities." These towers are to enclose the overhead gear at the new Rothes (Fifeshire) Colliery, and an architect's drawing, reproduced in *The Times*, shows a group of buildings looking more like one of the factories on the Great West Road than a coal mine. I think, however, that a modern power station (even with its cooling towers) is just as handsome.

★ ★ ★

Glasgow meter readers do not seem to be pleased with the decision of the South-West Scotland Electricity Board that they shall wear uniform jackets and caps. The idea is to prevent impostors passing themselves off as meter readers to gain entry to houses. This seems reasonable to me, but I do hope that it won't extend to other grades. Some measure of uniformity in electricity supply is desirable, but uniforms—never!

★ ★ ★

I should have thought that one great advantage of the electric heater is that it can be moved about to suit changing circumstances. The Eire Electricity Supply Board is against this, apparently, and requires storage heaters to be fixed in position, except in special circumstances. The Dublin branch of the Electrical Contractors' Association is protesting against this ruling. I suppose the danger foreseen by the Board is the use of unsuitable and unsafe extension wiring, probably flexible cord. This is avoidable by the installation of sufficient conveniently placed outlets.

★ ★ ★

What is going on at Stuart Street, Manchester, I wonder? In a local paper I read: "I was the first reporter to make a full tour of the new unit, and proud technicians showed me 'top secret' generating plant equipment—installed for the first time in a British power station."

Luxury Ship Lighting

COLD CATHODE TUBING IN THE "QUEEN OF BERMUDA"

THE Furness Withy liner *Queen of Bermuda* left the Tyne last month after a complete re-fitting at the Walker Yard of Vickers-Armstrongs, Ltd., to resume her sailings between New York and Bermuda. The *Queen of Bermuda* is a quadruple-screw ship of 22,500 tons with turbo-electric propulsion, and was placed in commission in 1933. Electricity has been used on the most extensive scale possible throughout the ship, and all the electrical equipment, ranging from the propulsion machinery to the lighting, was supplied by the General Electric Co., Ltd., and its associates.

The lighting of the ship has been renewed throughout and over eighty designs were prepared in the Fittings Design Office of the G.E.C. An outstanding feature is the extensive use of cold cathode fluorescent tubes; the installation is claimed to be the biggest afloat. It is fitted in most of the public rooms and comprises nearly three-quar-

(Above) Glazed trough and laylight with cold cathode tubing in first-class dining saloon. (Right) First-class dance space, with tungsten lighting in cornice and circular ceiling fittings. Cold cathode tubes concealed in cornices in outboard areas and fitted in glazed troughs.

First-class library with combined indirect cold cathode and direct tungsten lighting showing ormulu finish circular ceiling fitting with tungsten lamps

ters of a mile of tubing. Most of the tubes are installed to provide indirect cornice lighting. A 230 V a.c. supply is obtained from two rotary convertors operating on the ship's 230 V d.c. system with a third as a standby.

The first class dining saloon on "D" deck is lighted over most of its area by warm-white and gold tubes in cornices to give indirect illumination. Further tubing is fitted in a glazed cornice round the central well, and in the laylight in the centre of the well ceiling. At each end of the saloon is an elongated decorative ceiling fitting containing cold cathode tubes. Supplementary tungsten lamps are enclosed in fittings. Other tungsten lamps for window lighting are fitted in concealed "Gecoray" silvered glass reflectors on special mountings. The dining saloon foyer is illuminated by a number of handsome laylights with tungsten lamps.

First-class Lounge

A combination of cold cathode and tungsten lighting is seen also in the first class lounge on "A" deck, where warm-white tubes are concealed in a cornice running round the centre part of the room and a number of ceiling panels in the wings. The central portion of the ceiling contains a laylight illuminated by tungsten lamps housed in dispersive reflectors. There are four ornamental silver plated standards glazed with pink tinted glass and containing tungsten lamps.

The lounge is used for cinema and stage shows and all the lighting, whether cold cathode or tungsten can be controlled by a motor operated dimmer. The first class smokeroom is illuminated almost entirely indirectly from tungsten lamps but the room contains some handsome lanterns in "Oxysil" with pale amber glazing.

Indirect coloured lighting for the first class dance space comes from tungsten lamps in a cornice running round the area, there are also three circular tungsten fittings in the ceiling each 3ft in diameter with silvered metal work and peach tinted glass. Further tungsten lighting proceeds from eight semi-circular column fittings, 6ft high and 2ft wide. The outboard areas of the space have indirect cold cathode lighting from warm white tubes in the cornices, supplemented by a continuous run of cold cathode tube in a glazed trough and decorative tungsten ceiling and mirror lights. The whole lighting in the space is controlled by a colour changing and dimming device.

In the library and writing rooms indirect lighting from warm-white cold cathode tubes is blended with tungsten lighting. An ormolu finished circular fitting 3ft in diameter housing tungsten lamps is located in the centre of the library ceiling and is supplemented by harmonizing rectangular fittings. Each writing table has an attractive ormolu finished writing table fitting.

The verandah café on "A" deck also combines indirect lighting from warm-white tubes with tungsten lighting, which in the main is contained in eight flush laylights each 18in. by 64in. fitted with peach coloured plate glass. The cocktail bar on the same deck is appropriately and cheerfully illuminated by an attractive combination of white and gold tubes.

The tungsten lighting in the first class swimming pool follows the same plan as in the original installation, but the fittings have been re-designed. They are all ceiling fittings with white glass ranging in size from 3ft by 2ft 7in. to 1ft 7in. square and are finished matt silver.

All the lighting fittings in the first class entrances have been completely redesigned and the metalwork of the fittings throughout these spaces is finished satin silver, the glass being either plain or reeded.

All the lighting in the second class spaces is carried out with tungsten lamps in specially designed fittings. In the lounge, smokeroom and entrances the metalwork is bronze, but in the dining saloon the finish is matt silver, with either white or champagne glassware.

Two types of cabin fittings are used throughout the cabins and approximately 2,400 have been installed.

The design of the lighting fittings and the cold cathode lighting schemes were prepared by the Fittings Design Office and Illuminating Engineering Department of the G.E.C., working in collaboration with McInnes, Gardner & Partners, Glasgow, the decorative architects for the ship.

Another most interesting new equipment in the ship is the public address system comprising a network of 120 loudspeakers distributed throughout the vessel.

Correspondence

Letters should bear the writers' names and addresses not necessarily for publication. Responsibility cannot be accepted for the opinions expressed by correspondents

Motor Starting Conditions

THE booklet of the B.E.A.M.A. entitled "Alternating Current on Public Supply Mains—Starting Conditions," is the basis for installing new starters and motors. As very few consumers know which class applies to them, this information can only be obtained by enquiry from the Electricity Board concerned.

Because of lack of time and staff, it will be only in a few instances that in the preliminary stages of an enquiry reference is made to the proper authority. In consequence, it is very rarely that the manufacturer of electrically driven equipment obtains accurate information regarding the permissible starting current. Therefore often unnecessary expensive equipment is offered (and mostly also ordered).

It will be difficult to publish maps for the whole country indicating the districts, where Classes, A, B, C, D and E apply. However, to assist manufacturers the Boards might consider publishing at least maps of industrial urban areas with suitable markings. Furthermore, notices could be affixed to the meter boards of consumers specifying the class of connection, stating also the maximum permissible load with the existing supply cable.

H. E. SUMMERS, A.M.I.E.E.

Gateshead.

Tidal Power

REGARDING the discussion on the I.E.E. paper by Mr. H. Headland, you reported that Mr. S. B. Donkin had compared the Severn Barrage single tide scheme with the Menai Straits scheme, pointing out that the lengths of the dams in the latter case would be greater than the total length of the dam for the Severn scheme. The output of 12½ MW was also compared with the 800 MW from the Severn. May I be permitted to correct this statement?

The scheme I have submitted for the Menai Straits has three dams of a total length of 6,700ft measured at h.w.s. level, which is not half the length of the Severn Barrage. The comparison is further misleading because it is between a single tide and continuous output stations.

The 12½ MW output mentioned by Mr. Donkin would be increased to 16 MW if operated as a single tide station, and the total length of the dams would be reduced to 4,100ft, about one-quarter the length of the Severn dam, but the freedom to generate continuously and at any state of the tide would be lost, and the great natural advantages of the Menai Straits over other tidal sites would not be utilized.

It is questionable whether the advantage of the one tidal scheme over the other is a criterion, as both would be of great economic value to the country at a future date. It is contended, however, that in view of the fact that there is no purely tidal electric power scheme in operation the Menai Straits scheme, with its natural advantages and unusual features, and the considerably smaller capital expenditure, should be proceeded with before the much larger Severn Barrage scheme, so that the experience so gained could be used in connection with the Severn Barrage scheme.

Oswestry. F. O. HARBER.

Submersible Motors

WITH reference to Mr. Penlington's second letter (18th February), I must point out that one cannot digest the indigestible. Mr. Penlington makes no attempt to dispute the truth of what I wrote. His first letter implied that the eddy current losses in the steel sheath were sufficiently large to improve the power factor, and I maintain that if this is so, then it is supremely illogical to claim also that these same losses do not appreciably affect the efficiency.

I suggested (and I feel sure that he will agree) that it is the effective increase in gap length which affects the power factor, while any eddy current losses affect the efficiency. Perhaps the original author could confirm that this is what he intended to say.

I repeat that I know little about these very special submersible motors (to most engineers any submersible motor is special) but I should be interested to hear what factors are responsible for the per-

formance reduction apparent from Mr. Penlington's own figures. One manufacturer's ordinary S.C.R. machine of 35 h.p. and at 3,000 r.p.m. (synchronous—assumed) has an efficiency of 90 per cent and a power factor of 0.9. Presumably some of the additional loss is due to fluid friction and some of the power factor reduction to the enforced use of a smaller-than-normal rotor diameter (resulting in increased leakage reactance) but surely the sheath eddy current losses and the increased magnetizing current are in some measure responsible.

J. GRIFFIN, Graduate I.E.E.
Brentwood, Essex.

Is Compulsion Necessary?

REFERRING to W. Scott & Co.'s letter I think it is the electricians that should be registered not the contractor.

I served my apprenticeship in various departments of a small supply undertaking and was a student member of the I.E.E.; then the war came and put paid to further study, I joined the Forces and later was released for industry. After the war, to gain further experience, I moved around and have worked for three of the largest concerns in the country and I am surprised to find how many electricians have not "served their time."

The greatest number of electricians who had been anything but connected with the electrical trade before the war, I found working for British Railways and in many cases wanted more money than myself.

If every electrical worker had a certificate of registration as in New Zealand, South Africa and Canada, our accident rate would be lower and workmanship better.

"DISAPPOINTED."

IN further support of the compulsory registration of electrical contractors, here are a few examples of "electrical atrocities" committed since the war.

Full size (approx. 6 kW) cooker wired in 7/029. Connection from earth trip to earth electrode by means of one strand of 18 s.w.g. wire. Single-pole 5 A tumbler switch and single moulded plastic fuse unit used as lighting main switch-fuse. Supply to electric petrol pump in black enamel conduit running underground.

These efforts were all the work of either local supply undertakings or the installation departments of the Electricity Board for the area, so when, finally, we do get compulsory registration let it be enforced by an independent authority with no other concern than that of ensuring safe installations.

UBIQUE.

WITH reference to the letter and photograph from W. Scott & Co. in your issue of 11th February, regarding the above, it is stated that the 7/029 sq in cables were jointed to the 19/072 sy in. cables, the former terminating in the meter.

It appears, therefore, that the supply authority's meter fixer and installation inspector must have had the final say in this "strange method of connecting up a 65 h.p. load," and no criticism of the contractor is justified in this case as "tails" of adequate capacity were provided.

SUPPLY AUTHORITY EMPLOYEE.

Electricity Board Salaries

IN your issue of 18th February "Admin" says in effect that he does not believe that the "opinions" of "Analyst" represent the views of many in the electricity supply industry and suggests that his remarks are born of ignorance.

My own observations lead me to agree with "Analyst" that there is considerable dissatisfaction among a great many supply engineers at the present time. I would say that the majority are not nearly so happy at their jobs as they were before the industry was nationalized. One reason is that they feel they are not getting a square deal as regards salaries and conditions and another is that they feel that they are becoming very small cogs in a very big machine and that nobody seems to trouble whether or not these small cogs work smoothly.

Up to the present supply engineers have done excellent work and most of them understand that it is necessary to make use of experts in other than the engineering side as and when required. The services of these experts must cost money, but are they costing more in proportion than the relative value of those engaged on the engineering side. Perhaps "Analyst" was right in suggesting that engineers were not getting a square

deal. Here is a fine opportunity for him to tell engineers what he is doing to reduce costs and/or render better service to the consumer.

My experience does not lead me to believe that administration is costing less now than before vesting date, and I am of the opinion that there are more consumers who are dissatisfied now than ever before. I want to see the supply industry run on lines which are second to none as regards efficiency and service, and "Admin" should tell engineers what he is doing to help to achieve this. This should be a fairly simple task for him and I look forward to his reply.

B. CROWSLEY, A.M.I.E.E.
Welwyn Garden City.

Overseas Electrical Trade

EXPORTS FOR JANUARY £1¾ MILLION ABOVE PREVIOUS RECORD

A NEW high record of electrical exports was reached in January when the total of £11,417,452 exceeded that of the previous best figure recorded last November by no less than £1,760,413. This is all the more remarkable when it is appreciated that January had one fewer working day than November and included New Year's Day, a Bank Holiday in Scotland. Electrical goods and apparatus accounted for £7,314,483 of the total, nearly £1 million more than in December and nearly £1½ million more than in January, 1948.

Over £1 million worth of the goods and apparatus went to India, while almost as much was taken by South Africa. Australia's purchases (£711,973) were about double those of January last year, while Eire (£282,770), Malaya (£214,127), and Egypt (£201,341) continued to be good customers. A decline in exports to Palestine (£22,925, compared with £96,757 in January, 1948) was more than

TABLE I.—ELECTRICAL EXPORTS

Class	Jan., 1949	Jan., 1948
	£	£
Telegraph and telephone wires and cables (submarine) ...	49,237	73,489
Ditto, not submarine	536,070	422,174
Wires and cables, rubber insulated	646,350	450,695
Ditto, cotton, silk or artificial silk insulated	113,380	48,877
Ditto, enamel, glass or asbestos insulated	80,416	23,644
Ditto, paper insulated	808,633	468,925
Ditto, other	98,468	93,797
Commercial radio apparatus ...	216,615	228,285
Domestic radio apparatus ...	297,597	457,214
Telegraph, telephone and signalling apparatus	1,333,108	749,576
Radio loudspeakers	54,953	20,868
Sound reproducing apparatus components and parts, other than cinematograph apparatus	252,700	254,661
Other radio, etc., apparatus ...	56,252	37,114
Radio valves	178,582	158,560
Electric lighting carbons ...	8,992	10,766
Lamps, not exceeding 24 V ...	41,487	17,018
Discharge lamps	26,623	33,508
Other lamps	92,174	89,862
Other lighting apparatus ...	512,574	447,618
Primary batteries	83,581	34,146
Accumulators for motor vehicles	151,295	176,361
Ditto, traction	5,082	1,664
Ditto, radio	2,207	926
Other portable accumulators...	64,548	28,708
All other accumulators ...	46,254	38,884
Parts and accessories	64,508	59,735
Cooking appliances	153,721	115,451
Heating appliances	73,706	85,228
Parts and accessories of cooking and heating appliances ...	47,130	39,026
Flat irons	40,422	52,475
Commercial electrical instruments	99,567	89,671
House service meters	186,937	225,026
Time recorders and time switches	7,061	9,480
Other electrical instruments ...	65,594	43,352
Electro-medical apparatus (not X-ray)	39,419	25,673
X-ray apparatus, tubes and parts	104,479	64,835
Permanent magnets	13,387	14,043
Insulating cloth and tape ...	103,595	48,913
Other insulating materials ...	87,278	112,134
Unclassified goods and apparatus	470,501	360,900
Generators, up to 200 kW ...	677,007	235,409
Ditto, over 200 kW	478,628	211,647
Ditto, parts	208,388	229,174
Motors, railway and tramway...	22,250	6,030
Ditto, other, up to ¼ h.p. ...	151,011	74,290
Ditto, from ¼ to 1 h.p.... ...	79,975	61,534
Ditto, from 1 to 250 h.p. ...	612,236	332,670
Ditto, over 250 h.p.	70,025	40,490
Ditto, parts	74,119	40,205
Converting machinery	5,106	31,189
Transformers, including coils ...	443,833	318,854
Rectifiers for power house use...	20,584	22,537
Motor starting and control gear	216,098	137,615
Switchgear and switchboards (not telegraph or telephone)	769,357	531,523
Other electrical machinery ...	32,489	50,322
Vacuum cleaners and parts ...	128,672	98,899
Other electrically operated portable appliances	113,191	51,160
Total	11,417,452	8,186,830

counterbalanced by the increased demands of Syria (from £5,865 to £110,404) and Lebanon (from £20,014 to £73,970).

Shipments of both motors and generators were doubled compared with January last year. The figure for the former (£1,009,616) compares with £824,850 for December, while generator exports (£1,364,023) were approximately double those of that month (£638,114). Russia accounted for £573,666 worth of the generators, and India £122,518. The Netherlands took £66,000 worth of the motors.

TABLE II.—Distribution of Electrical Goods and Apparatus

Destination	Jan., 1949	Jan., 1948
	£	£
Eire	282,770	302,687
Channel Islands	30,621	46,532
Malta and Gozo	12,772	15,687
Cyprus	13,477	15,227
British West Africa	119,380	87,579
Union of South Africa ...	947,272	688,328
Northern Rhodesia	11,323	4,815
Southern Rhodesia	55,415	43,341
British East Africa	93,134	129,245
Bahrein, Koweit, Qatar and Trucial Oman	46,077	32,609
India	1,080,550	804,745
Pakistan	109,554	13,465
Malaya	214,127	140,960
Ceylon	79,819	42,127
Hong Kong	103,123	55,060
Australia	711,973	367,754
New Zealand	298,015	313,815
Canada	52,820	88,869
British West Indies	132,913	54,594
Anglo-Egyptian Sudan ...	11,335	10,937
Other British Countries ...	69,974	64,425
Soviet Union	127,441	8,033
Finland	35,400	26,364
Sweden	112,871	219,785
Norway	208,047	170,870
Iceland	12,294	12,517
Denmark	88,092	40,224
Poland	32,283	13,138
Germany	10,023	5,356
Netherlands	192,989	117,380
Belgium	99,582	158,410
France	84,901	76,348
Switzerland	31,467	51,983
Portugal	141,963	60,345
Spain	27,144	8,896
Austria	11,271	11,018
Hungary...	28,081	3,670
Czechoslovakia	17,472	25,866
Yugoslavia	4,231	1,171
Greece	75,836	57,219
Turkey	117,129	194,657
Dutch East Indies	36,595	25,198
Dutch West India Islands ...	8,110	11,399
Portuguese East India ...	24,376	28,897
Syria	110,404	5,865
Lebanon	73,970	20,014
Palestine	22,925	96,757
Egypt	201,341	125,090
Iraq	67,267	95,231
Iran	134,174	74,423
Burma	51,235	34,548
China	20,232	117,870
United States of America ...	39,860	12,238
Mexico	7,351	2,623
Colombia	10,041	6,408
Venezuela	73,065	48,632
Chile	36,238	12,258
Brazil	59,968	119,662
Uruguay	16,030	48,052
Argentine Republic	293,651	163,001
Other Foreign Countries ...	102,689	79,074
Total	7,314,483	5,713,282

Apart from the specifically electrical items included in our tables a very considerable quantity of other products exported can justifiably be regarded as largely electrical. The January figures for the most important of these, with the January, 1948, figures in parentheses, are: Compressors, £258,143 (£199,690); air-conditioning plant, £40,516 (£14,631); water-tube boilers, £528,743 (£330,738); other boilers and boiler-house plant, £516,806 (£480,155); cranes, lifts, escalators, hoists, etc., £727,165 (£585,252); dairy machinery, £162,478 (£80,846); fans, £154,216 (£97,268); food preparation machinery, £357,161 (£230,683); machine tools, £1,625,659 (£1,507,243); mechanical handling equipment, other than cranes and lifts and underground mining equipment, £212,140 (£108,670); mining machinery, £350,516 (£321,676); packing, packeting, bottling and labelling machinery, £196,800 (£107,712); plastics moulding presses, £85,862 (£8,709); pumps, £694,793 (£521,379); refrigerating machinery, £570,293 (£247,152); and welding machinery, including electrodes, £198,941 (£150,084).

Imports of electrical apparatus and machinery in January, though £70,357 more than in December, were £164,755 less than in January, 1948, the actual figure being £289,492. The largest items were radio apparatus, £55,585; motors, £42,542; X-ray apparatus and vacuum tubes, £26,307; and electrical instruments, £24,809. Imports of generators at £15,431 compared with £124,753 in January, 1948.

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PARLIAMENTARY NEWS

By Our Special Reporter

IN the House of Commons last week Mr. Rankin asked the Minister of Fuel and Power whether he was aware that the surcharge, the object of which was to restrict the domestic consumption of electricity, was no longer necessary; and whether he would now abolish it.

Mr. Gaitskell replied in the negative. He believed that the introduction of a differential tariff had helped to reduce demand for electricity this winter and so to diminish the risk of load shedding. Owing to the practice of continuous meter reading, it was not possible to bring all consumers on to the higher winter rate at the same time. There was bound, therefore, to be a period during which some consumers would be charged at the higher winter rate while others were paying the reduced rate.

Admiralty Engineers

Mr. Channon asked the Parliamentary Secretary to the Admiralty why, as the decision to employ naval instead of civilian personnel in the Directorate of Electrical Engineering was taken three years ago, it had not yet been found possible to give the staff side of the Admiralty Administrative Whitley Council any indication of the steps to be taken.

Mr. W. J. Edwards said that the decision referred to related to the introduction of an Electrical Branch into the Royal Navy, and was one of general principle only, requiring, as the staff side of the Admiralty Administrative Whitley Council was informed, much further investigation and consultation before any concrete scheme could be produced. There had already been preliminary discussions with the staff side, and he hoped, though he could not promise, that more detailed information would be given to them fairly soon.

Hearing Aids

Mr. Erroll asked the Minister of Supply in view of the fact that the specification and design details of the "Medresco" hearing aid might be used by any manufacturer free of charge, how he ensured that any instruments sold abroad included in their purchase price a proportionate amount of the British development costs.

Mr. George Strauss said that since, in accordance with the traditional practice in matters of medical research, no attempt was made to retain proprietary rights for the Government in the specification and design of the "Medresco" hearing aid, it would not be appropriate to impose any such charge on hearing aids manufactured for export.

Mr. Bossom asked the Minister of Supply if he was aware that great difficulty was being experienced in obtaining batteries for deaf aids; and how batteries would be obtained for aids which were bought before the introduction of those which were now provided under the National Health Service.

Mr. Strauss said his information was that there was no general shortage. The batteries referred to could be purchased either from the manufacturer of the hearing aid or from retailers.

Electrical Commercial Travellers

THE annual luncheon of the Electrical Trades' Commercial Travellers' Association was held at the Connaught Rooms, London, W.C.2, on Friday last, Mr. W. Herbert (chairman of the Association) presiding.

The toast of "The Association" was proposed by Sir Herbert Williams, who said that many of the members of the Association were faced with a new problem. It was possible that, as far as the home market was concerned, instead of there being many customers a central buying organization might be established. It might be good to standardize apparatus which had reached the stage of finality, but the electrical industry had been built up by the variety of ideas and designs, and he thought that the centralization of buying of only one type of product would be disastrous to the industry.

Sir John Dalton (president of the Association) said that his experience on the commercial side of the industry had led him to realize the importance of the salesman, without whom the industry would be completely hamstrung. The Association should have the respect of the whole industry in that its key object was one of benevolence.

Mr. F. W. Woods proposed the toast of the guests and Mr. H. Senior Fothergill, in responding, thanked the Association for the help it had given to the Electrical Industries Benevolent Association. Mr. E. A. Boxall (past-chairman) proposed the toast of the chairman, and Mr. Herbert, in reply, mentioned that the Association now had 550 members in the London area and 100 members in the Birmingham Branch. It was hoped to establish a Manchester Branch during the current year. Mr. S. Johnson, the charity steward, made an appeal for the Association's charities which resulted in a collection of £82.

Power Station Superintendents

CONFERENCE AT BUXTON

HADDON HALL HYDRO, Buxton, which has recently been acquired by the British Electricity Authority, started on its new career as an education and training centre on 14th February, when forty-five superintendents from the larger generating stations assembled, together with some of the chief generating engineers, for lectures and discussions on subjects of common interest, particularly those relating to the reorganization of the electricity supply industry as a result of the Electricity Act, 1947.

The Conference, which was the first of its kind, was opened by Lord Citrine, chairman of the Authority, who explained that the purpose of these courses was to establish the closest co-operation with the employees in an effort to stimulate their interest and to evoke a spirit of public service. The principal task of the Authority in the present formative period was to weld all the personnel together as closely as they could in a common understanding and a common purpose. By the method of conference, they were seeking to disseminate as widely as possible factual information of a basic character and to keep key personnel informed of current developments. It was especially important that in addition to technical questions matters directly affecting labour should be understood by those in charge of power stations.

Further talks which were given by officers of the Authority outlined the engineering organization of the industry and the technical developments which were planned for the future, the joint machinery for negotiation of wages and conditions and for consultation between Electricity Boards and trade unions on welfare and matters of mutual interest. Schemes of training were fully discussed, as was also the need for the provision of health and welfare facilities and for ensuring the safety of employees. There was also a talk on the legal rights and obligations of employees.

During the conference the party visited the Metropolitan-Vickers Electrical Co.'s works at Trafford Park, where they saw large turbo-generators and other electrical plant in course of manufacture. The final lecture was given by Mr. E. W. Bussey, C.B.E., a member of the Authority, who described in detail the negotiating machinery and the manner in which it functioned from works to national level.

In bringing the conference to a close on Friday, Lord Citrine explained that it was the first of a series of four which would embrace all the station superintendents of the large power stations in the country. It was an experiment which he believed would amply justify itself by enabling them all to realize that they were co-operating in a great national service.

Lord Citrine, chairman, B.E.A. (centre), with power station superintendents at the Buxton conference

PERSONAL and SOCIAL

News of Men and Women of the Industry

THE British Electricity Authority announces that **Sir John Hacking,** its deputy chairman (operations), accompanied by **Mr. F. Shakeshaft,** generation design engineer, and **Mr. W. B. Noddings,** deputy commercial manager, will leave this country on 13th April for the United States to investigate American practice in regard to electricity generation and power supplies in general. Sir John is also to attend the United Nations Scientific Conference on the Conservation and Utilization of Resources to speak on "Some Experiences of the Operation of the Electricity Grid System in Great Britain" in support of the general paper by Mr. Philip Sporn on "The Integrated Power System as the Basic Mechanism for Power Supply."

The N. & W. Wiltshire Branch of the E.I.B.A. has been revived with **Major C. S. Williams** as chairman, **Mr. R. Martin** as vice-chairman and hon. treasurer, and **Mr. A. Turner** (Southern Electricity Board, Calne) as hon. secretary.

Mr. W. J. Collins, A.M.I.E.E., deputy district manager, Tunbridge Wells South Eastern Electricity Board, has been appointed hon. branch secretary of the E.I.B.A. Kent Branch in place of Mr. Ernest E. Pope, S.E. Electricity Board, Maidstone, who still retains the branch treasurership.

Mr. G. Caton, M.I.E.E., managing director of Yorkshire Switchgear & Engineering Co., Ltd., and a director of the associated company, Electro Mechanical Manufacturing Co., Ltd., has left this country for a tour of the oilfields of Venezuela and the oil refining and other large installations in the Caribbean and Dutch West Indies.

Mr. H. MacKenzie has joined the staff of the Jackson Electric Stove Co., Ltd., as branch manager for Scotland. He has been associated with the electrical industry for the past twenty years and has just completed ten years with the English Electric Co., Ltd., with whom he had charge of domestic appliance sales in Scotland. He will be operating temporarily from "Wilbeth," 27, Moncks Road, Falkirk (Falkirk 1238).

Mr H. MacKenzie

Mr. L. A. S. Robbins, A.M.I.E.E., has now returned from South Africa and has rejoined Duncan Low, Ltd., Glasgow, in addition to representing the Arora Company, Loughborough, in Southern England. At present he is working from his private address, "Danecourt," Chapel Park Road, St. Leonards-on-Sea, Sussex.

Mr. J. W. Leach, M.I.E.E., is retiring from the position of chief engineer of the London Electricity Board, though, for a period, he will be assisting the Board in the completion of certain work. **Mr. D. Gray,** chief accountant, is also retiring. Mr. Leach received his training with the British Thomson-Houston Co., Ltd., and in due course became manager of the company's London office, in which capacity he was associated with the early contracts for the grid system. In 1933 he joined the Westminster Electric Supply Cpn., which was later combined with five other London companies to form Central London Electricity, Ltd., and in 1940 he became the engineer-in-chief of this company. In January, 1948, he was appointed chief engineer of the London Electricity Board. Mr. Leach is vice-chairman of the Supply Section of the Institution of Electrical Engineers, and in 1942 he was awarded the Ferranti Premium for his paper on "The Standardization of Distribution in Densely Loaded Areas."

The Board has appointed **Mr. D. B. Irving,** B.Sc., M.I.E.E., as the new chief engineer. Mr. Irving received his training with the British Thomson-Houston Co., and for several years afterwards was engaged in the Construction Department in connection with the equipment of supply systems and

other installations at home and abroad. In 1932 he joined the Central Electricity Board in the Mid-East England Area, and later was transferred to the Chief Engineer's Department. In 1948 he was appointed

Mr. J. W. Leach

Mr. D. B. Irving

Mr. H. C. Wells

construction engineer on the staff of the chief engineer of the London Electricity Board.

Mr. H. C. Wells, M.I.E.E., who was appointed deputy chief engineer of the London Electricity Board in February, 1948, and who has had over forty years' experience in the transmission and distribution of electricity in London, has been appointed engineering adviser to the chief engineer.

Mr. P. G. Stone Clark has been appointed a director of the National Electric Construction Co., Ltd.

The Council of the Institution of Mechanical Engineers has awarded the 1948 James Clayton Prize of £1,350 to **Mr. Karl Baumann** for his contribution to the advancement of mechanical engineering science by way of invention, design and investigation, communicated, in part, in a lecture delivered to the Institution in 1948. Mr. Baumann is the chief mechanical engineer and a director of Metropolitan-Vickers Electrical Co., Ltd. His professional life has been largely identified with the development of the modern steam power station, including steam turbines and boiler plant, and latterly the internal combustion turbine. He was born and educated at Zurich, where he became assistant to Prof. Stodola. He joined the Metropolitan-Vickers Company in 1909, and has been chief mechanical engineer since 1917. He has written many notable papers and made many important inventions, chiefly relating to steam turbine practice, on which he is an authority of international reputation. Perhaps his most important invention was one made in 1915 dealing with regenerative-turbine feed heating. In 1916 he patented the multi-exhaust design now universally associated with his name. The largest steam turbine in Europe, that of the 105,000 kW turbo-generator set in Battersea power station, was designed under his guidance.

Mr. K. Baumann

The Westminster Engineering Co., Ltd., announces that **Mr. J. W. Meacher** and **Mr. I. W. Innes** have been appointed directors. Mr. Wyatt Meacher, surviving founder of the company, which was formed in 1896, continues to act as managing director.

Mr. A. R. Blandford, who has been chief engineer and manager of the Switchgear Department of the English Electric Co., Ltd., since 1933, has now been appointed chief electrical engineer of the company. Mr. Blandford served his apprenticeship with the Walsall Electric Co., with whom he subsequently became assistant manager. In 1915 he joined the Electric Construction Co., Ltd., as an assistant switchgear engineer, and also became an instructor in electrical engineering at the Walsall, Dudley and Hednesford Technical Schools. He joined the Switchgear Engineering Department of the English Electric Co. twenty-six years ago, and four years later he became chief engineer. Mr. Blandford has represented the company on various B.S.I. and B.E.A.M.A. committees, and has also represented this country on the International Electrotechnical Commission, and was selected by the United States to represent them on the I.E.C. Committee No. 17 at their last meeting in Prague. He is one of two representatives for England on the Study Committee for Circuit Breakers of the Conférence Internationale des Grandes Réseaux Electrique.

Mr. A. R. Blandford

Dr. N. S. Japolsky, consulting engineer, formerly with C.A.V.-Lucas and earlier with Vickers-Armstrongs, Ltd., sailed from Liverpool on the 19th to take up a profes-

sorial chair at the West Punjab College of Engineering, Lahore, Pakistan.

Mr. J. D. Findlay, M.I.E.E., M.I.F., has been appointed divisional system operation engineer for the Midlands Division of the British Electricity Authority in succession to **Mr. P. W. Cash,** who has been transferred to the Authority's head office. Mr. Findlay was educated at King Charles Grammar School, Tunbridge Wells, and at Tunbridge Wells Technical College. He served his apprenticeship with A. H. Avery, of Tunbridge Wells, and later was with Johnson & Phillips, Ltd., the B.T.H. Co., and the Newcastle-on-Tyne Electric Supply Co. During the 1914-18 war he served with the Royal Engineers, following which he was with the Fulham and Plymouth electricity undertakings and the South Wales Power Co. before joining the Central Electricity Board in 1932 as control engineer and chief assistant operation engineer, Central England District.

Mr. J. D. Findlay

The completion in January of fifty years' service with the General Electric Co., Ltd., by **Mr. F. A. J. Ryde,** manager of the cable stores at Southampton, is of particular interest in view of the fact that there are no fewer than five other members of the Ryde family now in the employ of the G.E.C. in the Southampton area. Mr. Ryde's daughter, who is with him at the cable stores, and his son, at the Pirelli-General Cable Works, Eastleigh, have both been with the company for twenty-one years. His younger brother, Mr. S. Ryde, has completed forty-one years' service and has two sons with twenty-nine years' service between them; all three are at the G.E.C. Southampton Branch. Mr. F. A. J. Ryde has been manager of the cable stores for thirty-three years.

Front row (left to right): Mr. F. A. J. Ryde, Miss D. M. Ryde (daughter) and Mr. F. G. Ryde (son). Back row: Mr. S. Ryde (centre) with his sons Mr. S. F. W. Ryde (left) and Mr. D. C. Ryde (right)

Mr. W. A. A. Burgess, M.I.E.E., Midland area manager for A. Reyrolle & Co., Ltd., is retiring on 28th February after twenty-five years' service with the company. Mr. Burgess was educated at King's Lynn and at King's (then Armstrong) College, Newcastle-on-Tyne, and was trained as an articled pupil with the late Mr. J. Pilling, borough electrical engineer of King's Lynn. Subsequently he joined the Newcastle Electric Supply Co., Ltd., as a junior assistant, and later transferred to Merz & McLellan. Later he became electrical engineer to British Dyes, Ltd., at Huddersfield, and after two years became chief electrical engineer, continuing in the same capacity with the British Dyestuffs Corporation, Ltd. He joined Reyrolle's in 1924, and acted as liaison engineer in all the contracts undertaken by the company for the Central Electricity Board from its inception. In 1942 he served as chairman of the North-Eastern Centre of the Institution of Electrical Engineers.

Mr. W. A. A. Burgess

In a ladies' public speaking competition held by the British Electrical Development Association, London and Eastern Area, at Hesco Hall, Hendon, on 16th February, the first and second prizewinners were respectively **Miss D. E. Wagstaff** (aged nineteen), showroom assistant at the Northmet Sub-area showroom, and **Miss E. C. Webb,** demonstrator at the same showroom.

Dr. W. Hume-Rothery, F.R.S., has been awarded the Institute of Metals (Platinum) Medal for 1949, in recognition of his outstanding contributions to the science of non-ferrous metallurgy.

The staff of the **Liverpool Electric Cable Co., Ltd.,** recently attended a dinner and entertainment at the Exchange Hotel, Liverpool. Mr. W. J. Terry, managing director, travelled from London for the occasion, as also did Mr. G. E. Jewell (director) and Mr. F. W. Freeman (director of an associate company). Mr. J. T. Frost, works manager, proposed the toast of the company and Mr. Terry replied.

Lancashire Dynamo & Crypto, Ltd. announces the appointment of **Mr. A. J. C. MacLeod,** A.M.I.E.E., Assoc. M.C.T., as fractional h.p. sales manager. He will be working from the London office of the company at 94, Petty France, Westminster, S.W.1. Mr. MacLeod received his technical education at the Manchester College of Technology, and served his apprenticeship at the Trafford Park works of Metropolitan-Vickers Electrical Co., Ltd. Subsequent appointments were held in that company's offices at Manchester, Birmingham and London. He was, until recently, a senior technical sales engineer at the London office of the Electric Construction Co.

Mr. A. J. C. MacLeod

Mr. H. L. Satchell, M.B.E., manager of the B.T.H. Rugby Works Group since February, 1945, has been appointed a director of the British Thomson-Houston Co.

Mr. L. Gamage, M.C., vice-chairman and joint managing director of the General Electric Co., Ltd., has consented to act as president of the 1949 maintenance appeal for financial support for the Royal Commercial Travellers' Schools at Pinner. This is the first time in the long history of the Schools that a president has been chosen from the electrical industry.

Mr. J. W. Tydeman, manager of the export department of Duratube & Wire, Ltd., for the last two years, has now taken up the duties of general manager, which be came vacant upon the death of Mr. J. Veit, A.M.I.E.E. Mr. Tydeman commenced his early career with the National Telephone Co. and British Post Office and was with the latter until after war service in 1918. He then joined the Western Electric Co. as branch manager in South Wales; later he was with Standard Telephone & Cables, Ltd.

Colonel R. J. Walker, O.B.E., R.E., has been appointed an Inspecting Officer of Railways in the Ministry of Transport.

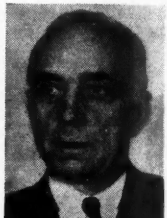
British Oil Engines (Export), Ltd., has appointed **Mr. J. Bradley** to be its regional superintendent in Latin America. Mr. Bradley will also act in the same capacity for the parent company, the Brush Electrical Engineering Co., Ltd. He will take up his duties during the early part of March and his territory will cover all the Latin American Republics in South and Central America and the West Indies. Mr. Bradley received his early training with the B.T.H. Co. at Rugby, and with D. Napier & Sons, Ltd. After serving with R.E.M.E. during the last war he joined the engineering staff of the Rio Tinto Co., Ltd., and served for some time in Spain as assistant chief electrical engineer of their mines.

Obituary

Mr. W. C. Knowles.—The death occurred on 13th February at the age of sixty-five of Mr. William Cordingley Knowles, Elland sub-area manager of the Yorkshire Electricity Board. Mr. Knowles, who had been with the Elland electricity undertaking for thirty-seven years, was previously chief assistant in the Cleckheaton U.D.C. Electricity Department.

Mr. F. A. G. Pope.—The death occurred on 8th February, at the age of sixty-seven, of Mr. F. A. G. Pope, a well-known member of the staff of the power line division of Standard Telephones and Cables, Ltd., which company he had served since 1902.

Mr. W. A. Randles.—The death occurred on 12th February of Mr. William Albert Randles, assistant on mechanical design to the chief turbine engineer of the British Thomson - Houston Co., Ltd. Mr. Randles was born in Hanley, Staffs, in 1888, and served an apprenticeship with Twyfords, of Stoke-on-Trent, at the conclusion of which he went to the G.E. Company (U.S.A.), and continued his technical training at the Union Engineering College, Schenectady. Subsequently, after a short time with the British Westinghouse Co., at Trafford Park, he joined the B.T.H. turbine drawing office in 1912, transferring to the Turbine Engineering Dept. in 1925. While in this department he was associated with the development of the Whittle jet engine from its inception, and later with the development of B.T.H. gas turbines. Mr. Randles leaves a widow.



The late Mr. W. A. Randles

Mr. R. A. Bailey.—The death occurred on 18th February, at the age of forty-seven, of Mr. R. A. Bailey, a director of English Clock Systems, Ltd. Mr. Bailey, with Mr. T. Johnstone, a director and general manager, founded English Clock Systems in 1936, and became associated with Smiths English Clocks, Ltd., in 1938.

Mr. A. T. Birkby.—The death is reported of Mr. Arnold Thornton Birkby, managing director of Birkby's, Ltd., which occurred on 20th February at Liversedge, at the age of sixty-seven.

RECENT INTRODUCTIONS

NOTES ON NEW ELECTRICAL AND ALLIED PRODUCTS

Propeller Fan

AN addition to the range of propeller fans of the GENERAL ELECTRIC CO., LTD., Magnet House, Kingsway, London, W.C.2, is a 9 in. model which is suitable for direct operation on d.c. or single- or three-phase a.c. mains. It embodies a die-cast aluminium mounting, which not only serves as a blade guard but also provides a neat curved grille for the fan aperture. A terminal box is incorporated in the mounting ring and resilient rubber cushions are provided at the fixing points to absorb any vibration.

G.E.C. 9 in. propeller fan

Panel Mounting Instruments

It is announced that moving iron and moving coil instruments with 6 in. square dials for flush panel mounting are now made by FERRANTI, LTD., Hollinwood, Lancashire. The cases are circular, being made from pressed steel, and the fronts moulded. These instruments are available with the usual ranges up to 300 A and 600 V.

Food Mixer

All kinds of foodstuffs from eggs to dry ingredients can be dealt with in a compact food mixer, only 8½ in. high, made by G. T. WESTON, LTD., 130, Vaughan Road, Harrow. A specially designed motor and drive give three speeds, ensuring effective and speedy mixing whatever the foodstuff. The bowl supplied as a part of the apparatus revolves on a ball-bearing turntable. The finish is cream enamel, with polished fittings and bakelite switch. The weight packed is 13 lb. The list price is £18 18s plus purchase tax.

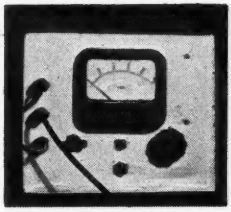
Weston food mixer

Open-Circuit Fault Locator

An instrument for the location of open-circuit faults in cables has recently been put on the market under the proprietary name of "Biobar" by BIO ELECTRICS, LTD., 22, Pitt Street, Glasgow, C.2. It marks a complete departure from the capacity bridge type of instrument, in that readings are obtained by direct measurement of the relative capacities of a broken and an unbroken core, all the variables in the circuit being automatically compensated.

The results are given in terms of any linear unit, feet, yards, metres, etc., by direct visual reading and, unlike the capacity bridge, aural aid is not required to determine the setting.

It will give results of practical accuracy on cables of up to 300 yd long, but where greater lengths are involved or where extreme accuracy is required the use of a correction factor is recommended, the reason being that in all readings a slight and unavoidable inaccuracy is present, which in the case of the shorter cables is so small as to be negligible for practical purposes.

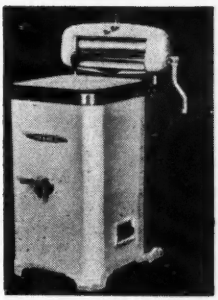


"Biobar" open-circuit cable fault locator

This instrument is a portable, robust and self-energized unit, the only parts requiring periodic renewal being the dry batteries, which are housed in a readily accessible compartment.

Electrically Heated Washing Machine

An electrically heated, hand-operated washing machine is among the latest products of UNIVERSAL BOILERS & ENGG. CO., LTD., Fulledge Works, Holmes Street, Burnley. This "Versco Major" unit, type D.L.3, which costs £19 17s 6d, plus £5 3s 4d purchase tax, is of square design finished in high-gloss white stove enamel, with a white vitreous enamel table top. The



"Versco Major" washing machine

hinged lid incorporates a rotary type agitator with detachable handle, the 14 in. hand wringer folding down at the back. The six 500 W mica contact type elements are controlled by the Jelson-Versco double-pole a.c. safety cutout.

"Perspex" Lighting Fittings

"Perspex" is treated by a new process, which ensures the retention of its lustre,

Falk, Stadelmann crystal lighting fitting in "Perspex"

in a new range of crystal and metalwork lighting fittings made by FALK, STADELMANN & Co., LTD., 91, Farringdon Road, London, E.C.1.

Pole-Changing Switch

An automatic switch for reversing the polarity of fluorescent lamps when they are used on d.c. mains is now being made by PETO PRODUCTS, LTD., Addlestone Road, Weybridge, Surrey. This device is housed in a robust metal casing and incorporates a solenoid-operated rotary switch, which functions every time the current is switched off, together with a series resistance and choke.

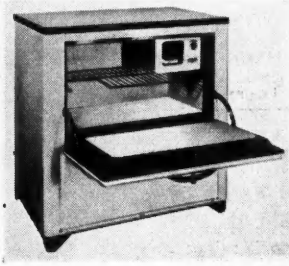
Convector Heater

At least twenty years is the estimated life of the elements of the new 2 kW "Raylux" convector heater E.4848, made by HUME ATKINS & Co., LTD., 66, Victoria Street,

2 kW "Raylux" convector heater

London, S.W.1. The spiralled nickel - chrome wire, which is run at just above black heat, is again spiralled on to a mica cruciform former, which is anchored to a metal support, so that no porcelain at all is used in the element construction. Switches are arranged to control a third of the total loading, one element being straight off the mains, or alternatively the unit can be controlled by a thermostat.

The elements are placed inside an inner container, with a curved baffle to direct the convected heat out into the room. The heavy-gauge sheet-metal construction makes the unit very suitable for schools or public buildings. The heater, which is 27 in. wide by 17 in. high by 6 in. deep, is usually finished in black wrinkle with chromium-plated grilles, but it can be supplied in colour to customers' choice. The retail price is £6 9s, plus purchase tax.



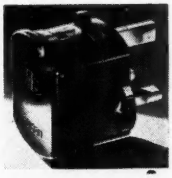
"Pilmore" table-top refrigerator

Table Top Refrigerator

A 3 cu ft table-top model is among a range of "Pilmore" refrigerators for which the ELECTRIC CONTRACTS & MAINTENANCE Co. (1925), LTD., 10, Princes Street, London, S.W.1, is the sole distributor. The drop-down door forms a useful rest when loading. Other types of refrigerators available include the "Console" 4 cu ft upright model and the "Twindor" 10 cu ft unit with two evaporators.

13A Switch-Plug

By the use of a switch-plug made by M.K. ELECTRIC, LTD., Wakefield Street, Edmonton, London, N.18, any 13A socket outlet made to B.S. 1363 can be immediately converted to a switch point. The switch is made for a.c.



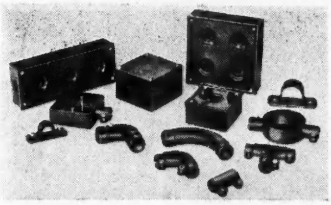
M.K. switch-plug

only and is housed between the mid-section and the base of the plug, thus sealing the action against dust, etc. The base and mid-section are of non-tracking material. Removal of a single screw gives access to the terminals and fuse. The robustness of the short break action with silver contact can be judged by the fact that the switches have been tested to over 100,000 cycles on full load without breakdown.

Conduit Fittings

Apart from component parts for vacuum cleaners, refrigerators and chicken brooders,

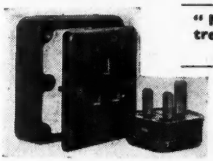
the HYGIENIC WIRE WORKS, LTD., Miles Road, Mitcham, Surrey, is now manufacturing a comprehensive range of ⅜ in. lug-grip conduit fittings, spacer bar saddles for ⅜ in. to 1¼ in. conduits, adaptable knock-out boxes of any size and both flush and surface mounting switch boxes of from 1 to 4 gang. These "Genyk" accessories are all made from sheet steel, being pressed and welded into the appropriate shapes. The production of ⅜ in. screwed fittings has just started and will be extended in due course as additional supplies of steel become available.



Selection of "Genyk" conduit fittings

New "Nettle" Products

VICTOR H. IDDON, LTD., Harper Road, Wythenshawe, Manchester, are offering supplies of moulded pattresses for converting "Nettle" 13A shuttered socket outlets from the flush to the surface type.



"Nettle" moulded pattress with flush type socket outlet

A new "Nettle" block batten holder has also been produced to meet the increasing demands for a batten holder of a more pleasing appearance and one which dispenses with the wooden pattress block. The porcelain interior lampholder is locked into position in the batten holder by a positive registering device. It is available with two or three terminals, the third terminal (for circuit looping) taking up to three strands of 3/0.029in. cable. The fixing screws, at 2 in. centres, are not visible. The unit can be obtained complete with shade carrier or Home Office skirt in either brown or white.

"Nettle" block batten holder

Butter Churns and Mixers

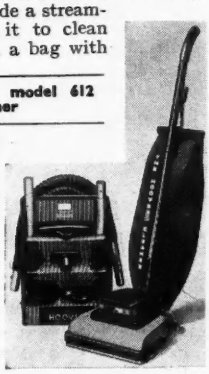
BROOKS & BOHM, LTD., 90, Victoria Street, London, S.W.1, are now marketing throughout England and Wales on a sole agency basis the "Easy" electric churn and mixer made by the Dairy Utensil Co., Belfast. Besides butter making, the machine can be used for mixing drinks, reconstituting dried eggs and dried milk, whipping eggs, etc. The cost is £12.

A butter churn designed to fit on to the oscillator spindle of an ordinary washing machine is now available from the GARSTANG EQUIPMENT CO., Barnacre, Garstang, Lancs. It has a churning capacity of half a gallon. An unbreakable "Perspex" lid permits a clear view of operations. The unit, which costs £3 17s 6d, is being made in collaboration with Bulpitt & Sons, Ltd.

Churn for fitting on to an ordinary washing machine

Vacuum Cleaner

Special features of the new "de luxe" upright model 612 vacuum cleaner made by HOOVER, LTD., include a streamlined front enabling it to clean under low furniture, a bag with a quick-release catch and a metal frame for facilitating emptying, a foot-operated switch, a broader "dirt-finder" light than on previous models, and an improved cleaning tool container. The well-known sweeping-beating action is incorporated. The price is 22 guineas, plus purchase tax.



Hoover "de luxe" model 612 vacuum cleaner

Warming Panels

The "Herga" electric warming panels have been designed by the H. G. POXON ENGINEERING CO., 33, Sudbury Court Road, Harrow, to give a source of medium temperature heat. The panels are fully insulated and are claimed to be safe and reliable under all conditions and practically indestructible. The panels consist of specially

made heating elements embedded in asbestos base phenolic bonded material, which is fireproof, shockproof, tough and not brittle, slightly flexible, and may be readily drilled near the edge for fixing.

The provisionally patented method of manufacture makes it possible to produce extremely thin panels and also to operate them at a relatively high wattage per sq ft with surface temperatures up to 100 deg C. Panels can be supplied in various sizes up to 33 in. square, $\frac{3}{16}$ in. or $\frac{1}{4}$ in. thick, with loadings up to 150 W per sq ft. The panels can be painted on site with heat-resisting paint or distemper to match surroundings, or can be supplied stove enamelled cream; other colours or wood finishes are available to special order.

Double Rope Hoist

Incorporating a double-ended hoisting rope and fully swivelling forged steel hooks, an electric hoist made by the GENERAL ELECTRIC CO., LTD., Magnet House, Kingsway, London, W.C.2, will handle goods weighing up to 2.5 cwt. Loading and unloading can be carried out simultaneously, operation being achieved by means of a one-hand push-button controller.

G.E.C. double rope hoist

The push-buttons and hooks are coloured red and black for easy identification, depression of either button raising the similarly coloured hook at a speed of 80 ft per minute.

Massage Vibrator

A massage vibrator hitherto reserved for the electro-medical trade and export is now available for general sale from FATTELAY & SHARP, LTD., 10a, Acton Street, Gray's Inn Road, London, W.C.1. The apparatus is of robust construction and the two-speed motor is housed in a polished aluminium case. The vibrator is equally suitable for deep body massage and for face massage and all beauty treatment. It is supplied in a case with six applicators.

Fattelay & Sharp massage vibrator

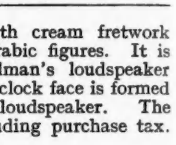
Combined Loudspeaker and Clock

An electric clock and radio loudspeaker are combined in a new product marketed by the BYFLEET FURNITURE, LTD., York Road, Byfleet. A Smith's clock movement is contained in a modern veneer case attractively finished with cream fretwork hands and matching Arabic figures. It is combined with a Goodman's loudspeaker unit. The centre of the clock face is formed by the fabric of the loudspeaker. The price is 8 guineas, including purchase tax.

Combined loudspeaker and clock

Induction Heater

A low-frequency induction heater, working on the eddy current principle, which will raise the temperature of a tool weighing 2 lb to 200 deg F in 4 minutes or 400 deg F in 15 minutes is now available from BASTIAN & ALLEN, LTD., 11, Bedford Square, London, W.C.1. It incorporates a temperature control device and is housed in a pressed steel case measuring 8 in. by 6 in. by 5 in.



Bastian & Allen low-frequency induction heater

Swivel Spotlight

The "Hyliter" swivel spotlight manufactured by COURTNEY, POPE (ELECTRICAL), LTD., Amhurst Park Works, Tottenham, London, N.15, has been designed to give emphasis to special features and displays in shop windows, etc. It comprises a spun aluminium housing securing a ball and socket joint which will fit direct to a ceiling plate, or may be used on a tubular extension rod. Special adaptor clamps are available for fixing the fitting to tubular stands, etc. A new 150 W internally silvered spotlight is used in conjunction with this fitting, which is supplied complete with heat-resisting flexible "tails" ready for use.

A built-in type of fitting, comprising a flush-fitting gimbal ring which can be moved 45 deg in any direction, is also available for the same purpose. It is fully louvred.

COMMERCE and INDUSTRY

Welding Conference : Radio Manufacture in India

IN an endeavour to spread knowledge of the latest techniques involved in welding processes and to promote the saving of steel and manpower, the British Welding Research Association, in conjunction with the Institute of Welding, has decided to sponsor a conference on the subject, which will be held at Osborne Hill, near Leamington Spa, Warwickshire, from 22nd to 25th March next. During this conference, which is to be conducted on the rapporteur system, a series of lectures will be given by leading authorities on welding, and it is hoped that full advantage of this will be taken by industrialists and their technical staffs in all sections of the industries concerned.

Isle of Thanet Company's Surplus

In the Chancery Division, on 18th February, Mr. Justice Roxburgh had before him a summons taken out by the liquidator of the Isle of Thanet Electric Supply Co., Ltd., for his decision whether or not the preference stockholders were entitled to participate in the distribution of a surplus of not less than £175,000 remaining after the payment of all liabilities and the repayment of capital.

His Lordship was addressed by counsel for the liquidator and the respondents—an ordinary stockholder who held that the preference stockholders were not entitled to participate, and a preference stockholder who contended that they were.

After hearing counsel his Lordship said that the case depended upon the construction to be put on the documents. It seemed to him that they clearly indicated that the preference stockholders should share in the surplus rateably with the ordinary stockholders, and he gave judgment to that effect.

Scottish Electricians' Award

In our last issue we reported that the National Arbitration Tribunal had awarded a wage increase of 1d an hour to journeymen electricians employed by members of the Electrical Contractors' Association of Scotland. The new rates, which take effect as from the beginning of the first full pay period following 4th February, are as follows:—Journeymen, 2s 10½d per hour. Apprentices: 1st year, 5¾d per hour; 2nd year, 8¾d; 3rd year, 11½d; 4th year, 1s 5¾d; 5th year, 1s 9¾d. The question of an increase in the jobbing rate, consequent upon the above award, has still to be considered by the Central Board of the Association.

F.H.P. Motor Display

An attractive display in one of the windows of the British Thomson-Houston Co.'s London office, Crown House, Aldwych, incorporates a ¼ h.p. motor in section, and, utilizing a large photograph of this motor, draws attention to some of its many special features. During 1948 great efforts were made to increase production, and most sizes are now available from stock. During the year there has been an almost complete change over to the general adoption of aluminium pressure die-cast end shields in an effort to overcome the general shortage of small iron castings. The use of the new endshields has not only reduced machining times, but has also resulted in cleaner appearance and lower weight. During the year the new spigoted swan-neck endshield has been brought into general use.

B.T.-H. fractional h.p. motor window display

Walsall Fuel Economy Exhibition

In conjunction with the Walsall Fuel Economy Exhibition Committee nine local E.C.A. members staged an Electrical Efficiency Exhibition in a section of the gas showrooms. The main part of the exhibit consisted of an imitation coal fire with four 500 W elements. The elements were wired through 2-way switches and a

large poster was displayed inviting the public to switch off a bar of the fire. Voltmeters and ammeters were put in circuit showing that as they did without each bar of the fire power was made available to the machines in an imaginary factory. In addition, dirty lamps and reflectors alongside clean ones illustrated lighting being wasted. Thermal storage water heaters demonstrated how easy it was to heat water during off peak periods for use during the peak periods. Altogether fifty pieces of apparatus were displayed.

Contract Price Adjustment Formulæ

The following are the latest figures for use in the B.E.A.M.A. contract price adjustment formulæ: Rates of pay: the rate of pay for adult male labour at 12th February is deemed to be 115s. Costs of material: The Board of Trade index figure for intermediate products at 12th February is 256s and is the figure for January.

Fluorescent Lighting in Navy

The Admiralty announces that fluorescent lighting systems are being developed for installation in new ships of the Royal Navy. Mess spaces, wardrooms, recreation rooms, surgeries, workshops and offices where the advantages of better illumination and less heat dissipation will be most beneficial, will receive first consideration. The scheme is part of a general one to improve the habitability of naval ships. Because ordinary commercial types of fluorescent lighting are generally unsuitable in spaces in which there is a congestion of girders, pipes and trunkings, a design has been developed incorporating two 24in tubes enclosed by a diffusing plastic under-bowl.

Investigation is also being made to ascertain the best means of preserving the night vision of sailors, particularly night lookouts and night flying aircrews. During the war red lighting was used extensively for this purpose, and now steps are being taken to find an ideal red and orange filter.

A.E.I. in South Africa

The directors of First Electric Corporation of South Africa, Ltd., announce that Associated Electrical Industries, Ltd., will acquire a substantial shareholding in the First Electric Corporation of South Africa, Ltd. First Electric Corporation will acquire the entire share capital of L. H. Marthinusen, Ltd., and National Electrical Manufacturers (Proprietary), Ltd., at present held by A.E.I., together with the rights over a loan previously made by A.E.I. to L. H. Marthinusen, Ltd. The total consideration payable by the First Electric Corporation for the acquisition of the whole of the share capital of the two companies and the right over the loan of £100,000 will be the issue to A.E.I. of 950,000 ordinary shares of 5s each as fully paid in First Electric Corporation of South Africa, Ltd.

These arrangements will not prevent the First Electric Corporation and L. H. Marthinusen, Ltd., from continuing to operate under their own names, but they will secure to the Corporation the advice and experience of A.E.I., under whose control operations will be conducted, and through which the Corporation will be enabled to extend its activities into a very wide field of electrical manufacture. These arrangements would have conflicted with the technical aid agreement between Laurence, Scott and Electromotors, Ltd., and the Corporation, which was confined to a.c. motors. Negotiations were therefore initiated with Laurence, Scott, as a result of which satisfactory arrangements have been concluded for the termination of their agreement with the Corporation. It is proposed that the Board of the Corporation shall be enlarged to reflect the interests of A.E.I. The provisional arrangements will be submitted to shareholders for their approval at an extraordinary general meeting of the Corporation.

Electricity Supply Regulations

A reprint of the Electricity Supply Regulations, 1937, which has just been published (H.M. Stationery Office, 6d), incorporates amendments made by the Electricity Commissioners in Regulations 4, 10 and 12.

Bath Fatality

At an inquest at South Shields on Alan Baskerville (25), who received a fatal electric shock in a bath at his home, the coroner (Mr. W. H. Patterson), in returning a verdict of "Accidental death," said that he could not stress too much how important it was that electrical connections should be done properly. It was stated that Selby, who had been listening to a football commentary, was found leaning out of the bath with his hands on a radio plug which apparently he had been trying to disconnect. Mr. W. T. Hetherington, of the North-Eastern Electricity Board, pointed out on the lead from the radio set an inch of bare wire near the plug. He described the attempted insulation as amateurish.

Sound Amplifying Equipment

What is perhaps the most advanced sound amplifying equipment ever fitted in a hall comprises thirty loudspeakers and six microphones recently installed in the Empire Room at the Trocadero Restaurant in London by Philips Electrical, Ltd. The loudspeakers are built into the ceiling, and

the six microphones can be plugged into any of seven six-way connecting boxes which are fitted flush with the floor in various parts of the room. The microphones are controlled by a small six-way switchbox. When one of these switches is depressed, it connects the microphone concerned and automatically brings into operation whichever loudspeakers have been selected on a pre-selection panel. This panel embodies a system of relays so arranged as to automatically disconnect the loudspeakers nearest to whichever microphone is in use. This allows the volume control to be turned up without the risk of howling, thereby allowing the microphone to be placed further from the person speaking. For example, it may be concealed in a vase of flowers.

Proposed Indian Radio Factory

Replying to a question in the Indian Parliament on 18th February, Dr. Syamaprasad Mookerjee, Minister of Industry and Supply, said that the Government of India is negotiating with four foreign concerns on the preparation of a report on the establishment in India of a state-owned factory for the manufacture of wireless and radar equipment. The companies are Standard Telephones & Cables, Ltd., London, Marconi's Wireless Telegraph Co., the Radio Corporation of America, and the Compagnie Général Telégraphie sans Fil, Paris. It was hoped to enter into an agreement in the next three or four weeks with one or more firms, he said. The reports would deal among other things with facilities necessary for the proper location, factory capital cost, raw materials required and cost of production. (*Reuter*, New Delhi.)

Modernized Ticket Office

The latest addition to the series of modernized ticket offices in the Eastern Region of British Railways was opened at Bowes Park station on 18th February by the Mayor of Wood Green, Councillor W. Evans. He was accompanied by Mr. C. K. Bird, chief regional officer. Lighting is by fluorescent tubes of "natural" tint. In conjunction with this, the walls and ceiling of the office are finished in primrose. Heating is by independently switched electric convector heaters, and there are electric vent fans. The design, lay-out and equipment of the office have been carried out by collaboration between the commercial superintendent, Eastern Region (Mr. C. Dandridge), the civil engineer (Mr. J. Campbell) and the electrical engineer (Mr. H. H. Swift). The Bowes Park office will be used by the Commercial Superintendent's Research Section as a testing station in connection with the standardization of office design and practice and mechanization of passenger and parcel booking. At the present time there is under test in the Bowes Park office a prototype electric ticket dating machine provided by the Bell Punch Co., Ltd., Uxbridge.

Instrument Manufacturers Dinner

The Scientific Instrument Manufacturers' Association of Great Britain is holding its annual dinner-dance at the Mayfair Hotel, London, on 6th May. Particulars can be obtained from Mr. A. G. Peacock, secretary of the Association, 26, Russell Square, London, W.C.1.

Gauge and Tool Makers' Certificate

The Gauge and Tool Makers' Association has introduced a scheme for award, under certain conditions, of a Craftsman's Certificate. Applications for award should be made on a special form available from the Association offices at Standbrook House, Old Bond Street, London, W.1, and will be considered from persons who have served a *bona fide* apprenticeship with a firm which is a member of the Association and have also passed the final examination of the City and Guilds of London Institute course in machine shop engineering (machinists', turners' and fitters' work).

Electroplating Equipment

All those engaged on electroplating or electrochemical work will find much of interest in a new catalogue issued by Silvercrown, Ltd., 178, Goswell Road, London, E.C.1. It contains details of a wide variety of plating equipment and auxiliary apparatus, including filtration and agitation units; air blowers and dust extractors; motor generators and rectifiers; polishing spindles, brushes and polishing materials; anodes, testing equipment and a diversity of electroplating chemicals and lacquers.

Technical Papers

Reprints of technical papers on sound recording, reproduction and allied subjects, read by members of the staff of Electrical & Musical Industries, Ltd., Hayes, Middlesex, before learned societies, are now available from the Advertising Division of that company at 2s 6d per copy. They are printed on art paper with semi-stiff covers and are well illustrated.

Birmingham Guide

The latest publication issued by the City of Birmingham Information Department, entitled "Your Guide to Birmingham," contains a large amount of information of value to the tourist and the business visitor. In its 32 pages there is a brief history of the city, together with information of the cul-

tural and educational facilities available. A street plan is included. Copies can be obtained from the Council House, Birmingham.

Parsons' Canadian Contract

As a result of a visit of Sir Claude Gibb, chairman, C. A. Parsons & Co., Ltd., to Canada, the company has secured from the Hydro-Electric Power Commission of Ontario a large order for plant for the Commission's new steam station. It comprises a dual-frequency set rated at 75,000 kW at 25 cycles and 90,000 kW at 60 cycles. It is reported that the value of the contract is about $2½ million and that the plant is to be delivered in about two years.

Changes of Name

The Micramatic Electrical Instrument Co., Ltd., has changed its name to Micramatic, Ltd.

H. C. Harris & Co., Ltd., of 13, Basinghall Street, E.C., have changed their name to Arcolectric (Sales), Ltd., with registered offices at Central Avenue, West Molesey, Surrey. Mr. H. C. Harris, for many years associated with Arcolectric (Switches), Ltd., has agreed to continue as managing director of Arcolectric (Sales), Ltd.

The Macintosh Cable Co., Ltd., has changed its name to British Insulated Callender's Construction Co., Ltd., and the Croydon Cable Works, Ltd., has changed its title to British Insulated Callender's (Export), Ltd.

"Electrical Review" Index

Readers who wish to secure a copy of the index to Volume CXLIII of the *Electrical Review* (July-December, 1948), which is now available, should apply to the Publisher, *Electrical Review*, Dorset House, Stamford Street, S.E.1.

Advertisement Correction

We regret that in the Midlands Electricity Board's advertisement on 18th February for a branch representative, Ironbridge, the provisional salary was given as £385 instead of £425 p.a.

Trade Announcements

The English Electric Co., Ltd., announces that Mr. W. E. Gilchrist has recently joined the staff of their Glasgow office as domestic appliance sales representative.

The Sterling Cable Co., Ltd., Aldermaston, Berks, announces that its chief buyer, Mr. C. N. S. Smith, is now at their London branch office, 90, Regent Street, W.1 (telephone: Regent 5001/2 and Mayfair 8948/9).

The telephone number of the Telcon works of the **Telegraph Construction & Maintenance Co., Ltd.,** has been changed to Greenwich 3291.

Musgrave & Co., Ltd., Belfast, announce that their Bristol branch office has been transferred to 35, Broad Street, Bristol, 1.

The address of the new Birmingham premises of the **Phosphor Bronze Co., Ltd.,** is 286-292, Bradford Street, Birmingham, 5.

Mr. J. Gibbings is now representing **Metropolitan Distribution, Ltd.,** for electrical and radio products in the Bournemouth area.

Communications in Palestine

It is reported from Tel Aviv that considerable expansion in telephonic and telegraphic installations is planned by the Israeli Government. Approximately a quarter of a United States loan of $100 million is to be spent on the extension of communications, including the purchase of automatic telephone exchanges, telephone and radio telegraph instruments, freight and passenger ships and harbour improvement.—*Reuter.*

Dissolution of Partnership

Messrs. N. Sharpe and F. Stork, carrying on business at Filey, Yorks, under the style of S. & S. Electrical & Radio Engineers, have dissolved partnership.

Catalogues and Lists

Philips Electrical, Ltd., Century House, Shaftesbury Avenue, London, W C.2.—Three illustrated folders on public address systems.

Courtney Pope (Electrical), Ltd., Amhurst Park Works, Tottenham, London, N.15.—Catalogue and price list of fluorescent lighting fittings.

Johnson, Matthey & Co., Ltd., 73-83, Hatton Garden, London, E.C.1.—Technical data sheet (No. 2100) on silver brazing alloys.

Gent & Co., Ltd., Faraday Works, Leicester.—Folder describing a closed circuit burglar alarm system.

Metway Electrical Industries, Ltd., King Street, Brighton, Sussex.—Priced catalogue of replacement elements for domestic appliances.

Murex, Ltd., Rainham, Essex.—Illustrated brochure surveying the activities of the different Murex companies, indicating the uses of the metals, alloys and fine chemicals produced by them.

Yarrow & Co., Ltd., Scotstoun, Glasgow, W.4.—Technical brochure on tubular air heaters of welded construction.

Ferranti, Ltd., Hollinwood, Lancashire.—Technical brochure on industrial power factor correction condensers.

Control of the Nile

Irrigation and Power Development

By SIR JOHN KENNEDY,
O.B.E., M.Inst.C.E., M.I.E.E.
(Uganda Electricity Board)

THE recently announced decision of the Egyptian Cabinet to lay before Parliament a scheme for co-operation with Uganda in the utilization and control of the waters of the Nile is of fundamental importance in deciding the most economical way of developing the hitherto untouched power resources of that river.

Egypt is vitally concerned in maintaining an adequate flow of water at all times and in preventing undue flooding in years of excessive rainfall, and the announcement above referred to results from an agreement which was made between the Governments of Great Britain and Egypt in 1929, whereby Great Britain agreed that, without the previous consent of Egypt, no irrigation or power works on any part of the river in the Sudan or Uganda would be undertaken if they would prejudice the interests of Egypt in any way.

Hydro-Electric Power in Uganda

Although the possibility of large-scale power development on the Nile in Uganda has long been recognized, the credit for inaugurating such a scheme in the Protectorate is due to the foresight of the present Governor, Sir John Hall, who established an Electricity Board for the whole of the country in accordance with a report (*Electrical Review*, 4th July, 1947, p. 17) submitted by Mr. C. R. Westlake in 1947 on the potential electrical requirements of the area. The best method of inaugurating a hydro-electric power supply in the initial stages was the subject of a very comprehensive report in 1948 by the Board's consulting engineers, who recommended the building of a dam and power station at the Owen Falls.

The complexity of the problems involved in controlling the flow of the Nile can best be appreciated by the following brief description of the course of the river.

The main source of the Nile is Lake Victoria which has an area almost as large as the whole of Ireland and lies principally in Uganda and Tanganyika, and to a smaller extent in Kenya. The Victoria Nile as it is first called then flows some 80 miles to Lake Kyoga and, leaving that lake, it flows northwards and westwards some 120 miles into Lake Albert. Half of the latter is in Uganda and half in the Belgian Congo, so the use of Lake Albert for storage, as is contemplated, will naturally affect both countries.

From Lake Albert the White Nile, as it is then called, flows some 130 miles northwards to the Sudan border. In the Sudan the White Nile is joined by the Blue Nile, which originates in Lake Tana in Abyssinia.

Minimizing Floods and Drought

Owing to the lack of control and of adequate storage, both Egypt and the Sudan suffer periodically from severe floods and droughts and any power developments on the river in Uganda should obviously be carried out in such a way as to minimize these troubles as far as is economically possible.

The largest natural storage for water is in Lake Victoria. As an indication of the extent of this storage, if the Nile outlet could be completely dammed, the level of the lake would only be raised about one metre in a little over three years.

Lake Victoria, lying on the equator, has an extremely large evaporation loss. In some years the total evaporation actually exceeds the run-off and on the average the loss amounts to as much as 93 per cent of the rainfall, leaving only 7 per cent of the rainfall for run-off to the river. This high rate of evaporation is partially attributable to extensive papyrus and other vegetation. Extended systems of cultivation in the vicinity of the lake might have the effect of reducing the evaporation and if the figure of 93 per cent could be reduced to, say, 90 per cent, the run-off (that is the water actu-

ally flowing down the Nile) would be increased by nearly 50 per cent.

Now to turn to the needs of Uganda itself. The country is an odd mixture of wealth and poverty. Rich in raw materials, such as copper, iron, wolfram, tungsten, potash, lime, cotton, oil seeds and grass suitable for making paper, but poor, first because the only indigenous fuel is wood, both inefficient and expensive and, secondly, because all imports—including oil required for all purposes—have to be rail-borne some 800 miles from the coast at Mombasa.

To counteract these handicaps and to enable the country's raw materials to be manufactured for home use or exported as finished or semi-finished products, cheap power is essential and that power is available in abundance from the Nile.

Between Lake Victoria and the Sudan border, the possibilities of power development amount to not less than 2½ million kW, or say 22 thousand million kWh, equivalent to the requirements of the whole of Great Britain in 1937!

The Owen Falls scheme, which is the first instalment of hydro-electric power in Uganda, has already been referred to (*Electrical Review*, 20th Feb., 1948, p. 279) and four turbo-alternators of 15,000 kW each have already been placed on order is this country. The station will be designed to contain several more units, but the final extent of these works will depend upon the details of the agreement with Egypt.

Evidence is already accumulating that considerable industrial activity will arise from the availability of adequate supplies of electricity at a reasonable price, and the Calico Printers' Association has recently obtained a licence to set up a cotton textile factory close to the proposed power station.

In the meantime, investigations are proceeding into the manufacture of cement and fertilizers from the deposits at Tororo and there is little doubt that the output of electricity will exceed considerably the estimates in Mr. Westlake's survey report of 1947.

Electricity Staff Compensation

DRAFT regulations governing the award of compensation to members of electricity supply undertakings' staff adversely affected by nationalization have been laid before Parliament. Copies of the draft (Electricity (Staff Compensation) Regulations, 1949) are available from H.M. Stationery Office, price 4d.

The Regulations require Electricity Boards to pay compensation for loss of employment, loss or diminution of emoluments or pension rights, or worsening of position, in circumstances such as are specified in section 55 of the Electricity Act, 1947, occurring before the expiry of ten years from the vesting date under the Act (1st April, 1948).

Those entitled to compensation are persons who during a specified minimum period immediately preceding the vesting date were employed by one or more bodies to whom Part II of the Act applied (in so far as concerns local authorities or composite companies, in employment wholly or mainly in their capacity as authorised undertakers) or were employed whole-time for the purpose of adminstering undertakings or parts of undertakings of authorised undertakers. Persons engaged at the vesting date on war service, who would have been in one of these categories if they had continued until the vesting date in their former employment are included.

There is a proviso to the effect that entitlement is only for persons who were required to devote to their employment an average of thirty hours or more per week; but to bring himself within the proviso, though not for other purposes, a claimant may count all time devoted to services as a director of a company to whom Part II of the Act applied. The specified minimum period is eight years after attaining the age of eighteen. There are three stages of compensation: immediate (Reg. 7), substantive (Reg. 8) and residual (not applicable in all cases) (Reg. 9).

Provisions defining the matters to be taken into account in assessing commpensation are contained in Reg. 6. Compensation is to be assessed by the Electricity Board concerned, but a right of appeal to a referee or board of referees is given to any claimant. The amount of the compensation may be reviewed, if circumstances change, at any time within two years of assessment, or, in the case of persons who have lost their employment but are later re-employed by an Electricity Board, or who, while still in the employment of an Electricity Board, are receiving compensation for diminution of emoluments, at any time.

Electricity Supply

Generation in January : Acton Station Reconstruction

THE monthly statistical statement issued by the Ministry of Fuel and Power shows that 4,787 million kWh was generated during January last, as compared with 4,546 million kWh in January, 1948, an increase of 5.3 per cent. The accompanying table gives further details including kWh sent out, plant capacity, and fuel consumed.

During the week ended 11th February, the output from solid-fuel-fired stations amounted to 1,026.1 million kWh, as compared with 1,023.5 million kWh in the preceding week and 888.9 million for the week ended 13th February, 1948. Stocks of coal at electricity undertakings at 12th February aggregated 3,360,600 tons.

GENERATION OF ELECTRICITY IN JANUARY

	Fuel Consumed thousand tons		kWh generated millions			kWh sent out millions	Installed capacity (m.c.r.) MW
	Coal	Oil	Steam	Water Power	Total†		
British Electricity Authority ...	2,800	4.0	4,599	55	4,670	4,409	12,913
North of Scotland*	19	1.0	29	84	117	115	326
Total for January, 1949 ...	2,819	5.0	4,628	139	4,787	4,524	13,239
Total for January, 1948 ...	2,856	4.4	4,381	148	4,546	4,300	12,864
Per cent. increase or decrease on 1948	—1.3	+13.6	+5.6	—6.1	+5.3	+5.2	+2.9

* Including North of Scotland Hydro-Electric Board and Lochaber Power Co.
† Including generation by other means amounting to 19.4 million kWh in January, 1949.

Grit Emission at Fulham

A deputation from Fulham Council met members of the British Electricity Authority last week to discuss the emission of grit from Fulham generating station. It was urged by the deputation that exceptional measures should be taken to expedite the installation of grit arresting plant.

Sir John Hacking, deputy chairman (operation), B.E.A., assured the deputation that the Authority was doing everything possible to get the contract for the grit arresting plant completed at the earliest possible date. In consultation with the Ministry of Supply, it had been decided that nothing would be gained by allocating the work between two firms. There had been no appreciable delay in placing the contract after the steel had been made available. The date on which the contractors were instructed to proceed with the work was 27th May, and the first material for the new plant was delivered to the station in January. It was expected that the arrestor plant for the first four boilers would be completed in August; a further four boilers would be equipped by December and the rest, sixteen in all, in batches of four at four-monthly intervals, by August, 1950. Every opportunity would be taken to improve upon this programme. It was quite out of the question to close the station down completely during the summer, as suggested by the deputation, in view of the generating plant shortage.

Mr. J. N. Waite, controller, London Division, indicated the magnitude of the work by stating that the total weight of steel required was over 1,000 tons; the steel plate used for fabricating the arrestors would cover an area of two acres; 20,000 individual cells made from about twenty miles of 6in. and 3in. diameter steel tubes had to be manufactured and assembled; and about five miles of seam welding would be carried out on site. The total length of the conveyors for the disposal of the grit was 2,000ft and these had to be threaded through a complexity of boiler house plant for which no provision was made in the original design.

The deputation expressed appreciation of the assurances given.

Power Station Enquiry

An enquiry was held at the Town Hall, Acton, on Tuesday into a proposal to rebuild the generating station at Acton Lane on adjoining land. After dealing with the urgent need to replace the Acton Lane station, the British Electricity Authority pointed out that to meet the future demand for electricity in the area it would be necessary, in addition to providing a new station

there, to make very extensive reinforcements to the grid transmission system. On the west side of London the problem was to find sites which were technically suitable. Since the River Thames was used extensively by the Metropolitan Water Board the amount of water which could be abstracted for electricity purposes above Teddington Weir was limited. Having given careful and detailed consideration to the continuation or otherwise of generation at the Acton Lane station, the Authority had formed the view that it would be wrong to abandon the site owing to the very great difficulty of finding a suitable alternative, and in any case there would undoubtedly be an addition to the burden of costs on electricity consumers if the site were abandoned. Details were given of the precautions to prevent nuisance. As regards the control of sulphur, the Authority pointed out that there was not sufficient water at Acton Lane to operate either of the recognized systems of flue gas washing, but if at some future date a system was devised which would surmount the technical difficulties, and did not place too great a burden on electricity consumers, the Authority would adopt it.

Success of Load Spreading

Following a meeting of the Electricity Sub-Committee of the London and South Eastern Regional Board for Industry last week, the chairman, Mr. E. J. Taylor, said that the results of the efforts by both commercial and industrial consumers to spread the load during the winter months had demonstrated that, providing due restraint was exercised by all consumers, there was no need for any compulsory restriction next month. If severe weather occurred in March, load shedding might be necessary, but this could be avoided if consumers took steps to reduce consumption in such circumstances. The Board and its Electricity Sub-Committee were extremely pleased with what had been achieved. He explained that the dropping of restrictions was effective for March only, and no decision had been taken on policy after the end of March as the National Electricity Economy Scheme came to an end with the end of next month.

Glasgow's Protest

A deputation from Glasgow Corporation last week met the South West Scotland Electricity Board to protest against the charges to domestic consumers in the city. A statement issued after the meeting said that the Lord Provost, on behalf of the Corporation, urged the immediate withdrawal of the winter surcharge. The chairman of the Board (Mr. J. S. Pickles) regretted that this could not be done in view of the Government's desire for economy in the use of electricity for domestic purposes, but said that the representations would be considered by the Board and communicated to the Central Authority. The Lord Provost then indicated that, in the event of the Board's decision being unsatisfactory, the Corporation would consider the advisability of approaching the Minister direct.

Interviewed later, Mr. Pickles said that the effect of the tariff increase and surcharge, while admittedly heavy in a limited number of cases, had been exaggerated in some instances. Over 80 per cent of the domestic accounts issued in Glasgow had involved an increase of less than £1 in the winter charges; in fact, the average increase on 70,000 accounts was 18s 3d.

N.E. Development

A review of the activities of the North Eastern Electricity Board since its formation shows that new electricity supplies have been afforded to 16 villages. The number of sub-stations commissioned is 134; capacity of transformers installed in new sub-stations 31,404 kVA; increased capacity of transformers in existing sub-stations to meet additional demands 11,203 kVA; number of additional farms connected 149; number of additional consumers connected 14,412; and length of new cables (excluding services) 60 miles overhead and 79 miles underground. Good progress has been made in the electrification of the housing estates.

Scheme Abandoned

The British Electricity Authority has decided not to proceed with its proposal to construct a £5,000,000 power station at Singleton, Lancashire. The scheme was opposed by the National Farmers' Union, local authorities and individual farmers in the area.

Australian Water-Power Plans

The Australian Government, in its plans for the development of the Snowy River diversion project which will take 25 years to complete, intends to recruit labour from Britain and Europe for the tunnelling and dam construction. The Government also proposes to send a special works officer overseas to engage technicians in Britain for the project and also technicians in America with experience in similar work.

Houses Without Electricity

Richmond (Surrey) Council is to proceed by stages with the wiring for electricity of all of its houses at present lighted by gas.

Sunderland R.D.C. has informed the Ryhope Parish Council that it would cost £15,000 to install electricity in 1,000 houses owned by the Rural Council which are at present supplied with gas.

FINANCIAL SECTION

Company News
Stock Exchange Activities

Reports and Dividends

R. A. Lister & Co., Ltd.—In the course of his speech at the annual meeting held on 18th February, Sir Percy Lister (chairman) said that the greatly increased cost of capital equipment made it essential that Governmental action should be taken to reduce the burden of taxation and to grant allowances for depreciation in some degree commensurate with present costs of replacements. Their company had a programme of replacement and expansion larger and more urgent than at any other period in its history. The new factories at Wroughton and Cinderford achieved fresh records in production month by month in response to the installation of new plant and equipment. At Dursley and Stamford new output records were established in 1948, and they believed that the current year would exceed the past. The factory in Sydney, N.S.W., was already earning. Associated and subsidiary companies now covering many of the main markets of the world were all showing increasing and encouraging returns.

Philips' Incandescent Lamp Works.—The Amsterdam Correspondent of the *Financial Times* reports that an extraordinary meeting of shareholders was to be held yesterday (Thursday) at Eindhoven for approving a proposal to conclude a $5 million loan. It is the intention to issue the loan in the Netherlands and subscriptions will be invited from sellers of dollar securities.

Taylor Tunnicliff (Electrical Industries), Ltd., reports a net profit for 1948 of £85,125, as compared with £88,219 for the preceding year. The ordinary dividend for the year is unchanged at 15 per cent.

Murex, Ltd., has declared an interim ordinary dividend of 7½ per cent; last year an interim dividend was declared in respect of the ten months to 30th April of 6¼ per cent, equivalent to a rate of 7½ per cent per annum. The directors state that although there has been some improvement in the supply of steel for welding electrodes, the activities of Murex Welding Processes continue to be restricted by the general shortage of that grade of steel.

Central Electricity Board. — Pending determination of the value of Central Electricity 3½ per cent stock, 1963-93, for the purposes of section 20 of the Electricity Act, the Minister of Fuel and Power announces the procedure for the payment of interest on the stock on 1st April next. Payments at the rate of 1½ per cent of £113 for each £100 of stock will be made to those registered as holders on 28th February.

Clarke, Chapman & Co., Ltd., propose to pay an unchanged dividend for the year of 12½ per cent.

The Eveready (South Africa), Ltd., is making a public issue in South Africa of 320,000 5s shares at 12s 6d each. The new capital is required for the expansion of the existing factory at Port Elizabeth.

New Companies

Whetstone Sound Services, Ltd.—Registered 12th February. Capital £100. Manufacturers, importers and exporters of and dealers in wireless, telephonic and television apparatus, etc. Directors: A. T. Allen, Alice M. R. Endall and H. O. Dickinson. Regd. office: 3, Monument Place, Liverpool.

Sidney Meadows, Ltd.—Registered 12th February. Capital £5,000. Vendors, manufacturers and repairers of and dealers in wireless and television sets, accessories and electrical fittings, etc. Directors: S. Meadows and W. F. Siadek. Regd. office: 4, Royal Oak Buildings, Waterloo Road, Blackpool.

Scott Radio Service, Ltd.—Registered 8th February. Capital £2,000. Directors: J. H. Akester and J. Speight. Regd. office: 456, Thornton Road, Bradford.

Southern Electrical Co. (Southborough), Ltd.—Registered 10th February. Capital £1,000. To acquire the business of electrical and wireless engineer carried on by F. Pendlebury at Southborough. Directors: F. Pendlebury and Edith Pendlebury. Regd. office: 56a, London Road, Southborough.

Etelco, Ltd.—Registered 10th February. Capital £100. Manufacturers of and dealers in inter-telecommunication, telephone, telegraph and radio apparatus and supplies, and acoustical equipment, etc. Directors: T. Kirkham and J. L. Reed. Regd. office: 22, Lincoln's Inn Fields, W.C.2.

Wootton Radio, Ltd.—Registered 10th February. Capital £400. Directors: P. S. F. Harwood and C. E. A. H. Mugliston. Regd. office: Lushington Garage, Wootton, I.W.

Vernon Cooper (Broady), Ltd.—Registered 11th February. Electrical and general engineers, wholesalers and retailers of electrical machinery, tools, radio sets and components, refrigerators, and cooking and domestic appliances, conductors of retail

shops and workshops, etc. Directors: V. Cooper and C. W. Broady. Regd. office: Radio House, High Street, Nantwich.

Graham & White, Ltd.—Registered 11th February. Capital £2,000. Manufacturers and repairers of and dealers in wireless transmitting and receiving sets, television sets, etc. Directors: L. D. White and J. S. Graham. Regd. office: 247, Regent Street, W.1.

Worboys Electrical Installations, Ltd.—Registered 11th February. Capital £1,000. Electrical and mechanical engineers, manufacturers of electrical plant, electrical factory equipment, refrigerators, heaters, cookers and electrical household equipment, wireless and television sets, etc. Directors: H. W. Worboys and Esther W. Worboys. Regd. office: 7a, High Road, Chadwell Heath.

Hackbridge Electric Construction Co., Ltd.—Registered 14th February. Capital £100. Subscribers: O. H. Giesen and R. B. J. Richards. Solicitors: Slaughter & May, 18, Austin Friars, E.C.2.

Feltham Radio Services, Ltd.—Registered 14th February. Capital £400. Electricians, mechanical engineers, workers of and dealers in electricity, radio, television. motive light and power, etc. Directors: A. G. Mills and Doris E. Mills. Solicitors: F. B. Brook-Caldwell & Conway, 13, Old Square, Lincoln's Inn, W.C.2.

Meico Lamps, Ltd.—Registered 12th February. Capital £6,000. Electrical, mechanical and radio engineers, manufacturers of and dealers in fluorescent and cathode tubes, electric lamps, etc. Directors: L. Black, Beatrice M. Black, J. Worden, A. Parkinson, F. Edmondson and J. W. Sheldon. Regd. office: 9, Cavendish Square, W.1.

Increase of Capital

Brush Electrical Engineering Co., Ltd.—Increased by £1,330,000 in 530,000 5½ per cent cumulative preference shares of £1 each and 3,200,000 ordinary shares of 5s each, beyond the registered capital of £1,500,000.

Companies to be Struck Off the Register

The names of the following companies will be struck off the Register at the expiration of three months from 8th February, unless cause is shown to the contrary:—Gold Coast and Ashanti Electric Power Development Corporation, Ltd.; Allied Electrical Export Corporation, Ltd.

Liquidations

The Trans-Oceanic Wireless Telegraph Co., Ltd.—In voluntary liquidation. Meeting of members on 17th March at Electra House, Victoria Embankment, London, W.C.2, to receive an account of the winding-up by the liquidator, Mr. H. G. Thomas.

Bankruptcies

L. O. Richardson, The Bungalow, Norway Lane, Littlehampton, Sussex, electrical contractor.—Receiving order made 9th February, 1949, on debtor's own petition. First meeting 25th February at the Official Receiver's office, 8, Old Steine, Brighton. Public examination 8th April at the Court House, Church Street, Brighton.

C. R. A. Chadfield, residing at 13, Albert Street, and carrying on business at 12, Nottingham Street, both in Melton Mowbray, Leics., electrical engineer.—Last day for receiving proofs for dividend 2nd March. Trustee, Mr. G. S. Robinson, 1, Berridge Street, Leicester, Official Receiver.

A. Proctor, 6, Manor Close, Burton-on-Trent; **G. P. Harrold,** 81, Rowdale Road, Great Barr, Birmingham; and **E. Baxter,** 30, Rowdale Road, Great Barr, Birmingham, carrying on business in co-partnership at 51, High Street, Swadlincote, Derbyshire, under the style of Universal Sales & Services, radio and electrical distributors.—Trustee, Mr. T. B. Quail, Lombard House, Lower Parliament Street, Nottingham, appointed 14th February, 1949.

J. W. Johnson, 34, Lacey Gardens, Louth, Lincs, electrician, and lately carrying on business at Newbridge Hill, Louth.—Last day for receiving proofs, 5th March. Trustee, Mr. H. S. Bloomer, 8, Flottergate, Great Grimsby, Official Receiver.

Trade Marks

APPLICATIONS have been made for the registration of the following trade marks. Objections may be entered within a month of 16th February:—

DALECTRIC.—No. 660,946. Class 7. Electrically operated beer engines and electrically operated beer pumps.—Gaskell & Chambers, Ltd., Dale End Works, Dale End, Birmingham, 4.

GLOMATIC.—No. 668,459. Class 8. Electric implements for both shaving and cutting the hair.—John Astley & Sons, Ltd., Far Gosford Street, Coventry.

TELEMITRON.—No. 664,489. Class 9. Electronic discharge devices included in Class 9, and television apparatus.—Electric & Musical Industries, Ltd., Blyth Road, Hayes, Middx.

HIKONOL.—No. 669,357. Class 9. Electric capacitors (condensers).—The Telegraph Condenser Co., Ltd., Wales Farm Road, North Acton, London, W.3.

PARAGEN.—No. 661,201. Class 11. Furnaces and plant, all for use in the heat-treatment of metals; and gas generating plant; all being goods included in Class 11.—Wild-Barfield Electric Furnaces, Ltd., Elecfurn Works, Watford By-pass, Watford, Herts.

STOCKS and SHARES

THE majority of alterations that have occurred in Stock Exchange prices over the past week are again in the downward direction, and the general tendency of markets as a whole can best be described as dull and lifeless. The gilt-edged group keeps up well, with Transport threes 101¼ and British Electricity threes 103½. Cable & Wireless have been active and strong.

Dividend Limitation?

Answers to the F.B.I.'s questionnaire to industry on the subject of dividend limitation disclose so far a rough balance between companies in the first category, which agree to another year of the standstill, and those in the second, which commit themselves no further than a "policy of moderation and restraint." Many replies, however, made the policy provisional on a corresponding restraint in the matter of wages, Government expenditure and other connected factors. Subject in several cases to such saving clauses, respondents in the first group so far include B.I.C., British Oxygen, Cossors, Crompton Parkinson and Westinghouse Brake. Vickers come in the second group. Replies by Tube Investments and I.C.I. make significant reservations.

Cable & Wireless Fluctuations

Few of the falls that have occurred in prices are of any notable consequence. General Electrics 90s, Burco 22s 6d, and Aberdare Cables 65s., are $\frac{1}{16}$th down. Revo at 59s 6d, East African Electric and Calcutta Trams, at 44s 6d and 27s respectively, are 1s lower. There are falls of 6d in Cossor, 9s 6d, Decca, 19s 6d, E. K. Cole, 9s 6d, and some of the overseas electrical shares, while, on the other hand, Murex strengthened to 98s 9d, Mather & Platt to 54s 6d.

Cable & Wireless ordinary rose from 221½ to 233, then eased off to 228½, leaving a rise on the week of 7 points. The 5½ per cent preference at 128½ has gained 3½.

Brush Electrical Engineering

In one or two months' time the market expects to see (conditions permitting) the Brush Company's capital proposals arising from last December's deal with Associated British Engineering. A current market circular sums up the position existing since the company's acquisition of Mirrlees, Bickerton & Day and J. & H. McLaren. From the capital point of view, it is recalled that bankers to the group have granted total overdraft facilities up to £4,000,000 upon the footing that additional permanent capital of at least £1½ million will be raised as soon as practicable after completion of the merger and the issue of the 1948 accounts. The latter amount is a little under the consideration agreed for the purchase of the two subsidiaries and satisfied by the issue of Brush preference and ordinary shares.

George Kent Issue

Dealings began last week in George Kent 10s ordinary and 4½ per cent £1 preference shares. Offered for sale at 14s. and 20s respectively, both classes attracted heavy oversubscription and have established useful premiums. The preference are now 21s 6d, at which they yield £4 3s 9d per cent on a dividend covered 7½ times on the basis of the profits earned in 1947-48. On the ordinary, now 15s, there is a prospective yield of 6⅔ per cent on the prospectus estimate of at least a 10 per cent distribution. This looks conservative against last year's surplus, equal to about 38 per cent earnings on the ordinary capital.

Miscellaneous Matters

Victoria Falls ordinary fell to £7¼ on the company's circulated estimate that shareholders will receive £7 12s per share on the winding-up of the undertaking. Out of that figure they are asked to contribute about 1s 2½d to provide for a 1s 6d premium on the repayment of the preference shares, which picked up in consequence to 21s. For compensation to directors and staff, the company is asking the equivalent of 1s 3d per ordinary share. Decca's original intention of a private placing for its £750,000 in 4½ per cent notes is being changed in favour of a public issue, for which lists open to-day, Friday. A similar amount is being raised by Westinghouse Brake in the form of a private loan, at 3½ per cent; the ordinary shares remain at 70s.

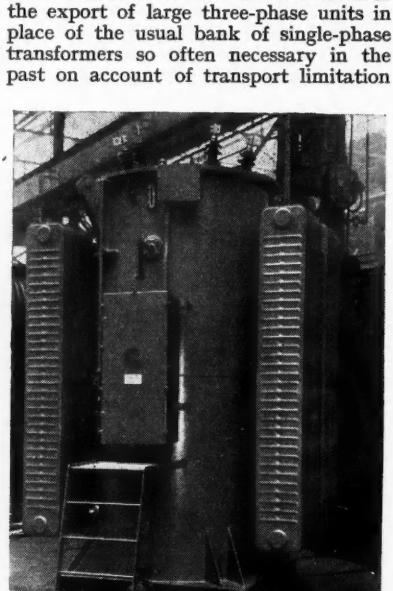
Thomas Tillings Ex All

On Wednesday in this week dealings were due to start in the British Transport 3 per cent guaranteed stock 1968-1973 issued to holders of Thomas Tilling shares. The price in the market, cum dividend, was 103, and as Tilling shareholders received £5 of this stock for every share they held, a sum of £5 2s should have been deducted when the price went ex dividend last week. On the previous evening Tillings closed 127s 6d, so, strictly speaking, £5 2s, plus 6d for the dividend, should have been deducted, making the starting price 25s. There were, however, literally dozens of buying orders in the market, with the result that Tillings, ex everything, were 29s within the space of a day or two, reacting later to 28s 3d, about 2s 9d up on the week. The stock will be distributed on 1st April, ex the dividend due on that date.

Manufacturing Progress

LARGE TRANSFORMERS FOR USE AT HOME AND ABROAD

SOME seventy-five large power transformers were ordered during last year from Ferranti, Ltd., including three-phase units of 64 MVA at 230 kV and of 100 MVA at 132 kV with on-load tap changing gear. Orders were secured for generator transformers for five major power stations and for single-phase transformers up to 50 MVA for bank operation overseas, but it is of interest to observe a move towards the export of large three-phase units in place of the usual bank of single-phase transformers so often necessary in the past on account of transport limitation



Three-phase 60 c/s 2,500 kVA moving-coil voltage regulator, 4,100-3,300-3,800-4,000 V, built for Brazil

and spares. Designs for shipment to remote situations with limited transport facilities have been an aspect of the Ferranti organization since it pioneered the first 110 kV transformers in Chile and New Zealand.

Orders for distribution transformers during 1948 continued at the high rate which has prevailed for the past two years. The company is now exporting transformers to some thirty overseas countries. There has been a very marked increase in the use of the moving-coil regulator for use on transmission circuits up to 33 kV, and a standard range of from 500 to 10,000 kVA capacity has been developed. Orders have been secured from five countries. In the industrial field the control circuit can be adapted to perform the duty required whether it be on a time, voltage, current or temperature basis, or on a combination of any or all of these factors.

The general move towards higher operating voltages has brought many orders for h.v. testing plant. The end of 1948 saw the completion of three 100 kVA single-phase, 50 c/s experimental high-voltage transformers for the British Electricity Authority. They are continuously rated and suitable for delta/star bank operation at a ratio up to 400/264,000 V for general experimental purposes in connection with transmission problems up to 264 kV. The transformers were impulse tested when completed and are suitable for outdoor operation, and are provided with Buchholz relay protection.

A further order placed by the B.E.A. for testing equipment covered an eight-stage impulse generator for 1,400 kV operation, together with auxiliary equipment and high-speed cathode-ray oscillograph.

Proposed European Grid

IN a report, published last week, Mr. N. H. Collisson, Mr. Averell Harriman's deputy in Germany, said that Germany's increased requirements for power-generating capacity could be met only within a European grid system, and he suggested that planning for such a system should start immediately. Such an integrated system of ultra-high-voltage transmission lines would tap the abandoned hydro-electric potential of the Scandinavian countries, the water power of the Alps, and the thermal energy from Central Europe. It was symbolic of the objectives of the Marshall Plan, since it would pool the resources of the participants for the common good of all.

Railway Train Control

COMPACTNESS AND RELIABILITY

THE first of the new category of "extra" meetings was held at the Institution of Electrical Engineers on 17th February. Sir John Hacking, who presided, said that these meetings were intended for the presentation of papers which did not fall within the scope of any one of the specialized Sections and were not of sufficiently wide interest to be read at an ordinary meeting. He emphasized, however, that the standing of a paper was not affected by the type of meeting at which it was read.

The paper was on railway traction control-equipment as used for suburban London transport, and its author, Mr. E. Webster (London Transport Executive) summarized the types employed and explained how they differed. The majority employ a series-parallel circuit for two motors with bridge transition. Earlier equipment is electromagnetically controlled and later gear is pneumatically controlled. Particulars were included of the latest electro-pneumatic camshaft control and of metadyne equipment.

Mr. C. M. Cock (Railway Executive) said that modern control gear for traction equipment was reliable in operation and compact, but there was need for still more compact arrangements in order to provide space for the other equipment which was creeping in on main-line multiple-unit trains. Reliability was very high and control gear could be left unattended for long periods.

Too Much Maintenance

Mr. E. H. Croft (G.E.C.) said he had had a controller sealed for two years and it had not required any maintenance. In an earlier instance there had been perpetual trouble until a certain relay was sealed up, which put a stop to maintenance instead of increasing it. Dealing with metadyne equipments, he asked whether any other form of regeneration had been considered. He thought that good regenerative equipments could be made with various forms of compound motors, as on trolley-buses.

Mr. W. S. Graff-Baker (London Transport) said that with traction automatic control equipments the tendency was towards complexity. Anything that was complicated in proportion to its function was wrong. By plotting failures per 100,000 car miles against the number of control circuit contacts in London Transport equipments receiving the same type of maintenance, it was found that a straight line law connected the two. When they contemplated using metadyne equipment they thought that, at the worst, the saving in energy would pay for the extra interest charges involved in the higher price, but, in fact, owing to the increase in the cost of coal, they had made a handsome profit. He was very sceptical of the possibility of regenerating substantial quantities of energy into conductor rails or overhead wires with normal railway or tramway services. It was not possible to get the energy away to another train, or even to a substation, unless it was very close, without raising the voltage to a point which, to say the least, was inconvenient.

Mr. W. T. Gray (Metro-Vick) said that by far the largest number of equipments operating in the world were of the unit switch type with sequence operation, which was very versatile. Designers were striving to improve the reliability of interlock contacts and modern switches were proving not the least reliable part of the equipment.

Regenerative Braking Drawbacks

Mr. F. D. Lester (B.T.H.) asked whether electric braking was worth while on multiple-unit suburban stock. It involved, he said, difficulties due to additional equipment and in dealing with the energy at the substation, if there was not another train in the section. This was particularly true in the case of rectifier substations. Moreover, the regenerative brake was rather unpredictable in its action, since it must depend on the line voltage at the instant of braking. The claim that it saved wear on brake shoes and wheels would not be fully realized unless every axle was motored and braked; otherwise the train would still have to be withdrawn at intervals to service the brake shoes on the non-motored axles The latest equipments on the New York subway employed a rheostatic brake instead of any form of regeneration and had also gone back to the motor-operated camshaft.

Mr. H. H. C. Barton said that the auxiliary circuits were often more troublesome than the main equipment and suggested that steps should be taken to reduce the number of train wires, which must be embarrassing with automatic couplers. It might be possible to combine some of the circuits.

Mr. E. Webster, replying to the discussion, agreed that in some cases the frequent examination of relays led to more trouble than leaving them alone. On the question raised by Mr. Lester, he said that there was already sufficient difficulty in dealing with the regeneration from half the axles which were motored.

Next Week's Events

Monday, 28th February

BIRMINGHAM.—James Watt Memorial Institute, 6 p.m. I.E.E. South Midland Radio Group. "Some Industrial Electronic Servo and Regulator Systems," by E. W. Forster and L. C. Ludbrook.

CARDIFF.—At the South Wales Institute of Engineers, 6 p.m. I.E.E. Western Utilization Group. "Polyphase Commutator Machines," by B. Adkins and W. J. Gibbs.

NEWCASTLE-ON-TYNE.—Neville Hall, Westgate Road, 6.15 p.m. I.E.E. North-Eastern Centre. "Overhead Line Regulations," by H. W. Grimmitt.

Tuesday, 1st March

ELTHAM.—Castle Hotel, High Street, 8 p.m. A.S.E.E. South-East London Branch. "Copper-Sheathed Mineral Insulated Cables," by G. E. D. Redman.

GLASGOW.—Electrical Society of Glasgow. "Ring Main Argument," by H. M. Spiers and D. C. Lindsay.

LEEDS.—Yorkshire Electricity Board Offices, 6.30 p.m. I.E.E. North Midland Centre. "Analysis-Synthesis Telephony, with special reference to the Vocoder," by R. J. Halsey and Dr. J. Swaffield.

MANCHESTER.—Engineers' Club, Albert Square, 6.15 p.m. I.E.E. North-Western Centre. "Electric and Diesel-Electric Traction on the Netherlands Railways," by H. J. van Lessen.

Wednesday, 2nd March

BIRMINGHAM.—James Watt Institute, 7 p.m. Junior Institution of Engineers (Midland Section). Discussion on "Light Alloys and Current Engineering Practice," opened by H. A. Wainwright.

LONDON.—Savoy Place, W.C.2, 5.30 p.m. I.E.E. Radio Section. "The Analogies between the Vibrations of Elastic Membranes and the Electromagnetic Fields in Guides and Cavities," by E. C. Cherry.

I.E.E. London Students' Section, 2.30 p.m. Visit to Enfield Cables, Ltd., Enfield.

At the Institution of Mechanical Engineers, Storey's Gate, S.W.1, 6 p.m. Institution of Heating and Ventilating Engineers. "Post-War Research on Heating and Ventilation at the Building Research Station," by A. Pickles.

L.T.R. Headquarters Refreshment Club, 8th Floor, Waterloo Bridge House, S.E.1, 5 p.m. Institution of Post Office Electrical Engineers. Informal meeting. "The Validity of the Faults per Tel. per annum Statistic as a Criterion of Telephone Service," by S. Rüdeforth.

PORTSMOUTH.—City Council Chambers, Clarence Parade, 6.30 p.m. I.E.E. Southern Centre. "The Measurement of Light and Colour," by G. T. Winch.

ROMFORD.—Mawneys Arms, Mawneys Road, 8 p.m. A.S.E.E. North-East London Branch. "The Work of Executive Council," by E. J. Sutton.

Thursday, 3rd March

CROYDON.—Café Royal, North End, 8 p.m. A.S.E.E. South London Branch. "Power Factor," by W. S. Gearing.

LEEDS.—At Queen's Hotel, 12.45 for 1 p.m. E.D.A. (Yorkshire Area). Annual luncheon.

LONDON.—Savoy Place, W.C.2, 5.30 p.m. Institution of Electrical Engineers. "Electric and Diesel-Electric Traction on the Netherlands Railways," by H. J. van Lessen.

66, Portland Place, W.1. Royal Institute of British Architects. Industrial Building Conference. (Continued on 4th March.)

RUGBY.—Electricity Showrooms, 6.30 p.m. Joint meeting of the I.E.E. Rugby Sub-Centre and the Rugby Engineering Society. "Electricity in the Modern Rolling Mill," by W. J. Pool.

Friday, 4th March

BIRMINGHAM.—Grand Hotel, 6.30 for 7 p.m. Birmingham Electric Club. Annual dinner.

Chamber of Commerce, New Street, 7 p.m. Television Society (Midlands Centre). "The Televisor, a Home-Built Television Receiver," by W. I. Flack.

Storey's Gate, St. James's Park, S.W.1, 6 p.m. Joint meeting of the I.Mech.E. and I.E.E. "Causes of Flue Gas Deposits and Corrosion in Modern Boiler Plants," by W. F. Harlow.

39, Victoria Street, S.W.1, 6.30 p.m. Junior Institution of Engineers. Films, "The Boulder Dam," introduced by S. R. Broderick.

Saturday, 5th March

LONDON.—I.E.E. London Students' Section, 10 a.m. Visit to High Voltage Laboratory, Queen Mary College, E.1.

New Instrument Factory

AN expansion of manufacturing capacity is announced by Everett, Edgcumbe & Co., who are opening a branch factory at Houghton-le-Spring, Co. Durham. This new manufacturing unit will be concerned in its initial stages with "Synclock" products, such as miniature synchronous motors, process timing devices, synchronous clocks, drives for roll charts and disc chart graphic instruments. The factory will be equipped with all the requisite machine tools and process equipment as well as test facilities, so that it can develop into a complete manufacturing unit. Later, these facilities will be extended to deal with other products.

Administration, sales and purchasing will remain centralized at the Colindale Works, Colindeep Lane, Hendon, London, N.W.9, and all enquiries, orders and other correspondence should continue to be addressed there.

The new factory will be under the management of Mr. C. Leney, who was previously in charge of the instrument shop at Colindale. Certain key workers have also moved to Houghton but, in the main, local labour will be recruited for the new establishment.

NEW PATENTS

Electrical Specifications Recently Published

The numbers under which the specifications will be printed and abridged are given in parentheses. Copies of any specification (2s. each) may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2.

1941

UNION d'Electricité and Compagnie pour la Fabrication des Compteurs et Matériel d'Usines à Gaz. —"Devices for distributing the loads between the various power stations of a systems of mains or between the various generators of a power station." 3514. 3rd July, 1939. (617234.)

1943

Metropolitan-Vickers Electrical Co., Ltd., and A. Tustin.—"Control systems for power-driven movable objects." 4824. 24th March, 1943. (617056.)

Metropolitan-Vickers Electrical Co., Ltd., and T. B. Somerville.—"Electrical control or regulating systems and control or regulating devices." 4878. 25th March, 1943. (617235.)

British Thomson-Houston Co., Ltd.—"Electric motor control systems." 6142. 23rd April, 1942. (617324.)

Sperry Gyroscope Co., Inc.—"Devices for attenuating high-frequency electromagnetic energy." 17015. 4th February, 1942. (Cognate application 17016/43.) (617236.)

1944

English Electric Co., Ltd., and W. E. M. Ayres.—"Magnetic couplings, brakes or dynamometers." 23741. 28th November, 1944. (617060.)

A. G. Kirk.—"Line taps for electric cables." 26058. 29th December, 1944. (617061.)

1945

Smith & Sons (England), Ltd., and F. W. Meredith. —"Automatic control apparatus." 6004. 9th March, 1945. (617240.)

British Thomson-Houston Co., Ltd.—"Resistance welding and testing." 11250. 4th May, 1944. (617415.)

London Passenger Transport Board, H. Honey and A. Readman.—"Thermionic relay for the protection of electrical circuits." 12559. 17th May, 1946. (617417.)

Carnegie-Illinois Steel Corporation.—"Means for controlling the electric heating of a moving continuous metallic article." 13587. 12th October, 1944. (617158.)

Marconi's Wireless Telegraph Co., Ltd.—"Electron-discharge devices and associated resonator circuits for use at high frequencies." 19394. 31st December, 1943. (617332.)

Compagnie Générale d'Electricité.—"Electrical systems of producing harmonics." 19911. 27th October, 1944. (617066.)

Sadir-Carpentier.—"Radio-pulse-echo device for measuring the distance of moving objects." 23642. 3rd March, 1944. (617243.)

Burnley Aircraft Products, Ltd., and T. Fletcher.—"Means for securing the heating elements of electrically heated domestic wash boilers and domestic washing machines." 26830. 13th October, 1945. (617073.)

Standard Telephones & Cables, Ltd., G. Newton and E. L. Nightingale.—"Die-castings." 28592. 29th October, 1945. (617336.)

Akt.-Ges. Brown, Boveri & Cie.—"Generation of grid voltages for the grids of electric vapour arc or discharge convertors." 28676. 28th March, 1945. (617244.)

G. Briggs.—"Waving hair by electric induction heating." 28880. 31st October, 1945. (Cognate applications 28881/45 and 4633/45.) (617246.)

English Electric Co., Ltd., and E. A. Howell.—"Electronic valve device for maintaining an electrical current substantially constant." 29033. 1st November, 1945. (617163.)

Marconi's Wireless Telegraph Co., Ltd.—"Electron-discharge devices of the magnetron type." 29066. 29th May, 1944. (617248.)

Compagnie Générale d'Electricité.—"Storage battery casing and process of making the same. 32165. 19th July, 1941. (617249.)

Westinghouse Electric International Co.—"Dynamo-electric amplifying generators." 32406. 30th November, 1944. (617075.)

Babcock & Wilcox Co.—"Multiple electrode arc welding." 34715. 22nd December, 1944. (617077.)

M. Pucci.—"Terminal connectors for electric accumulators." 34755. 6th November, 1942. (617168.)

1946

British Thomson-Houston Co., Ltd. (General Electric Co.).—"High-frequency magnetrons." 2385. 24th January, 1946. (617251.)

Marconi's Wireless Telegraph Co., Ltd.—"Diversity radio receiving systems." 3323. 1st February, 1945. (617254.)

B. I. Wood.—"Means for heat control for electric cookers and the like." 5942. 26th February, 1946. (617085.)

Marconi's Wireless Telegraph Co., Ltd., and N. E. Davis.—"Wide band coupling transformers, for use on very high-frequencies." 6735. 4th March, 1946. (617088.)

G. Briggs.—"Electric heating apparatus for use in hair waving." 7264. 8th March, 1946. (617257.)

A. Bosny and W. Simonis.—"Arc-welding tongs." 7664. 6th December, 1943. (617174.)

Jack & Heintz, Inc.—"Electronic gauge and indicating means." 7796. 28th July, 1945. (617423.)

Marconi's Wireless Telegraph Co., Ltd.—"D.c. reinsertion circuits more particularly for television receivers." 8347. 17th March, 1945. (617258.)

D. C. Johnson.—"Apparatus responsive to the polarity of a direct potential." 8833. 21st March, 1946. (617424.)

Marconi's Wireless Telegraph Co., Ltd., and B. J. Witt.—"Radar installations." 8955. 22nd March, 1946. (617177.)

Precision Developments Co., Ltd., and G. Olah.—"Electric follow-up control mechanism." 9032. 23rd March, 1946. (Cognate application 37743/46.) (617425.)

Marconi Instruments, Ltd., and C. F. Brocklesby.—"Electrical repeaters." 9174. 25th March, 1946. (617261.)

G. I. Babat.—"Polyphase valve generators." 9268. 26th March, 1946. (617091.)

Western Electric Co., Inc.—"Attenuators for use with wave guides." 9663. 30th March, 1945. (Addition to 576145) (617092.)

Compagnie Générale de Télégraphie sans Fil.—"Electronic device for producing or amplifying electrical energy at very high frequencies." 9824. 3rd October, 1940. (617344.)

Pye, Ltd., and A. V. Lord.—"Television receivers or the like." 10852. 9th April, 1946. (617263.)

Soc. Anon. de Participations Appareilage Gardy and R. Widmer.—"Switches for electric cookers and heating apparatus." 11676. 16th April, 1946. (617265.)

Philips Lamps, Ltd.—"Device for amplifying modulated high-frequency oscillations." 12658. 10th January, 1942. (617096.)

E. L. C. White and R. W. Elborn.—"Thermionic valve circuits." 13010. 30th April, 1946. (617184.)

Philips Lamps, Ltd.—"Control devices for adjustable electric components." 13168. 14th January, 1942. (617098.)

Marconi's Wireless Telegraph Co., Ltd.—"Manufacture of luminescent screens." 13665. 5th May, 1945. (617099.)

Standard Telephones & Cables, Ltd.—"Telecommunication exchanges." 14200. 15th April, 1941. (617100.)

Automatic Telephone & Electric Co., Ltd., and C. R. Woodland.—"Automatic switches for use in telephone or like systems." 14619. 15th May, 1946. (617267.)

Aktieselskabet Moss Glasvaerk.—"Electric furnace for melting glass." 14745. 24th September, 1943. (617349.)

Standard Telephones & Cables, Ltd., and W. L. Garfield.—"Arrangement for indicating the rate-of-change of a physical effect." 14811. 16th May, 1946. (617269.)

Philips Lamps, Ltd.—"Electric-discharge tubes and

circuit arrangements therefor." 14968. 5th August, 1939. (Cognate application 14969/46.) (617187.)

Metropolitan-Vickers Electrical Co., Ltd., M. C. Crowley-Milling and G. Saxon.—"Microwave electric equipment." 15367. 21st May, 1946. (617270.)

Pye, Ltd., and T. A. Butler.—"Arrangements for mounting the chassis of a radio or like apparatus within a cabinet." 15460. 22nd May, 1946. (617102.)

Procédés Sauter.—"Electric heating elements." 17103. 13th July, 1945. (617271.)

Sturdy Electric Co., Ltd., G. T. K. Lark and R. B. Davie.—"Control of electric-discharge lamps." 18473. 19th June, 1946. (617354.)

Naamlooze Vennootschap Philips' Gloeilampenfabrieken.—"Radio-altimeters and like distance meters." 19068. 1st May, 1942. (617355.)

Philips Lamps, Ltd.—"Holders for electric-discharge tubes. 19083. 28th June, 1945. (617356.)

Standard Telephones & Cables, Ltd., and C. G. Treadwell.—"Signalling over electric pulse communication systems." 20301. 8th July, 1946. (617277.)

Philips Lamps Ltd.—"High-frequency energy devices for medical purposes." 20338. 11th July, 1945. (617203.)

Philips Lamps, Ltd.—"Electric gas discharge-tubes." 21223. 16th June, 1942. (617112.)

British Thomson-Houston Co., Ltd., and C. Stewart.—"Projection for electric control apparatus." 21299. 16th July, 1946. (617279.)

A. Carraro and F. Carraro.—"Electrical push-button switches." 21745. 20th July, 1945. (617114.)

Sadir-Carpentier.—"Television and like circuit arrangements." 22224. 6th November, 1944. (617357.)

Philips Lamps, Ltd.—"Cast-iron welding." 22925. 10th October, 1942. (617116.)

Holophane, Ltd., S. English and J. G. Holmes.—"Prismatic glassware." 23147. 2nd August, 1946. (617210.)

British Thomson-Houston Co., Ltd.—"Hard metal alloys." 23301. 6th August, 1945. (617212.)

J. E. Varay.—"X-ray tubes." 24203. 2nd June, 1943. (617216.)

Metropolitan-Vickers Electrical Co., Ltd., and D. S. Gordon.—"Measuring circuits." 24305. 15th August, 1946. (617217.)

Laboratoires Radioélectriques.—"Device for measuring the frequencies of electric oscillations." 25829. 1st February 1944. (617438.)

Standard Telephones & Cables, Ltd.—"Transmission mechanism." 26834. 10th September, 1945. (617130.)

Trico Products Corporation.—"Retractive electric switch." 27333. 19th September, 1945. (617359.)

Metropolitan-Vickers Electrical Co., Ltd., and J. A. Kuyser.—"Flexible couplings." 27867. 17th September, 1946. (617132.)

Marconi's Wireless Telegraph Co., Ltd., and A. W. Lay.—"High-frequency heater arrangements." 28152. 19th September, 1946. (617287.)

Standard Telephones & Cables, Ltd., T. F. S. Hargreaves and E. A. Foulkes.—"Arrangements for modulating the frequency of an electric carrier wave." 28299. 20th September, 1946. (617139.)

Standard Telephones & Cables, Ltd.—"Spring and insulator stud assemblies, and apparatus for forming such assemblies." 28302. 24th September, 1945. (617140.)

C. L. Lacey.—"Electrically heated towel rails and the like." 28425. 23rd September, 1946. (617360.)

Philips Lamps, Ltd.—"Variable-electric condensers." 28439. 20th March, 1943. (617289.)

P. Berger.—"Electro-deposition of chromium." 28482. 24th September, 1946. (617292.)

D. C. Gall.—"Detectors for use in high-speed temperature measurements." 28588. 24th September, 1946. (617295.)

Standard Telephones & Cables, Ltd., and S. S. Hill.—"Time base circuits for cathode-ray oscillographs." 28626. 25th September, 1946. (617297.)

British Thomson-Houston Co., Ltd.—"Hydrogenated polymers." 28800. 27th September, 1945. (617311.)

Philips Lamps, Ltd.—"Superheterodyne radio-receivers with image-frequency suppression." 28806. 3rd March, 1943. (617312.) "Circuits for supplying electric current to apparatus operated by direct current." 28810. 28th September, 1945. (617313.)

British Thomson-Houston Co., Ltd.—"Electric-motor control systems." 28875. 22nd March, 1944. (617366.)

Naamlooze Vennootschap Philips' Gloeilampenfabrieken.—"Multiple-contact switches and relays." 28909. 21st April 1943. (617372.)

Philips Lamps, Ltd.—"X-ray tubes." 28918. 15th March, 1943. (617373.)

M-O Valve Co., Ltd., and B. N. Clack.—"Gas and/or vapour-containing discharge devices." 28930. 27th September, 1946. (617376.)

J. Crawford.—"Electric fuses of the cartridge type." 28940. 27th September, 1946. (617377.)

Standard Telephones & Cables, Ltd.—"Receivers for time modulated electric pulses." 28953. 23rd February, 1945. (617440.)

Western Electric Co., Inc.—"Wave guide phase shifters." 28971. 26th April, 1945. (617381.)

N. V. Van Der Heem.—"Electrically driven hand-held tools." 29046. 26th January, 1944. (617387.)

Orbit Electrical Co., Ltd., and H. J. Thomas.—"Fluorescent materials and light sources incorporating the same." 29073. 30th September, 1946. (617390.)

Standard Telephones & Cables, Ltd., and B. B. Jacobsen.—"Means for introducing inductance into electric circuits." 29089. 30th September, 1946. (617391.)

H. Bradford.—"Electric lock." 29107. 30th September, 1946. (617394.)

Metropolitan-Vickers Electrical Co., Ltd., and W. T. Gray.—"Electric traction control equipment." 29115. 30th September, 1946. (617395.)

Radio Corporation of America.—"Apparatus for heating dielectric materials electronically." 29116. 28th September, 1945. (617396.)

Philips Lamps, Ltd.—"Circuits for phase modulation of electric oscillations." 29126. 29th May, 1943. (617397.)

A. C. Sampietro and D. R. Robertson.—"Control of electrically actuated clutches adapted to couple a variable-speed motor to a driven element." 29169. 30th September, 1946. (617405.)

A. C. Sampietro and D. R. Robertson.—"Electromagnetically actuated friction clutches." 29170. 30th September, 1946. (617406.)

British Thomson-Houston Co., Ltd.—"Electric capacitors." 29239. 5th October, 1945. (617446.)

Svenska Turbinfabriks Aktiebolaget Ljungstrom.—"Power producing unit." 29267. 20th December, 1945. (617453.)

D. Rushworth.—"Method of and means for supplying electric power to an electrically driven lawn mower or other portable electric machine." 29310. 2nd October, 1946. (617456.)

Babcock & Wilcox, Ltd., and C. H. Sparks.—"Means for regulating the temperature of superheated vapour." 29364. 2nd October, 1946. (617463.)

Sloan Electrical Co., Ltd., and W. F. C. Holden.—"Fluorescent or other lighting systems." 29365. 2nd October, 1946. (617464.)

Sparks Brown & Co., Ltd., A. L. Sparks and A. T. Boreham.—"Thermostatic control arrangements for electric hair-driers." 29374. 2nd October, 1946. (617467.)

M-O Valve Co., Ltd., and D. A. Wright.—"Thermionic cathodes." 29389. 2nd October, 1946. (617470.)

Westinghouse Electric International Co.—"Electrolytic polishing of silver." 29508. 13th January, 1945. (617487.)

Static Condenser Co., Ltd., and E. C. Stanley.—"Sliding contacts for conductors for high-frequency currents." 29554. 3rd October, 1946. (617494.)

W. C. Pallant and S. C. Epsom.—"Cut-off switch for temperature control of electrically heated apparatus." 29643. 4th October, 1946. (617496.)

G. Briggs.—"Automatic control systems for high-frequency electrical dielectric heating installations." 36636. 11th December, 1946. (617319.)

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G. Briggs.—"Automatic control systems for high-frequency electrical induction heating installations." 3025. 23rd November, 1945. (Divided out of 617245.) (617322.)

J. E. P. Vernaux.—"Electric calculating machines." 20274. 8th May, 1946. (Divided out of 614639.) (617323.)

CONTRACT INFORMATION

ACCEPTED TENDERS AND PROSPECTIVE ELECTRICAL WORK

Contracts Open

Where "Contracts Open" are advertised in our "Official Notices" section the date of the issue is given in parentheses.

Argentina.—BUENOS AIRES.—25th March. Directorate-General of Water and Electrical Power. Hydro-electric and diesel-electric generating sets for the Neuquen dam. (C.R.E. (I.B.) 34326/49. Ten/227.)*

BUENOS AIRES.—15th March. Distribution transformers. (C.R.E. (I.B.) 4640/49. Ten/230.)*

Burnley.—21st March. Corporation. Electrical installation in proposed municipal offices. (See this issue.)

Canada.—WINNIPEG.—9th March. Department of Mines and Natural Resources, Manitoba. Control switchgear. (C.R.E. (I.B.) 4448/49. Ten/229.)*

Denbighshire.—County Council. Engineers wishing to submit tenders for the installation of electric lighting and inter-communication telephones in Ruthin County Offices extensions should submit their names to the county architect by 14th March. (See this issue.)

Edinburgh.—North of Scotland Hydro-Electric Board. Contractors wishing to tender for the supply, delivery and erection of 132 kV transmission lines in the county of Inverness should communicate with the engineers, Kennedy & Donkin. (See this issue.)

Great Yarmouth.—7th March. Corporation. Electric cables for one year from 1st April, 1949. (See this issue.)

India.—MADRAS.—3rd May. Government Electricity Department. Equipment for five substations. (C.R.E. (I.B.) 4437/49. Ten/231.)*

Newport (Mon).—7th March. Housing Committee. Electrical installations in fifty houses. (18th February.)

Uruguay.—MONTEVIDEO.—Usinas Electricas y Telefonos del Estado. 22nd March. Electric bells and accessories. (C.R.E. (I.B.) 3639/49. Ten/219.)* 24th March. 250,000 metres of vulcanized double conductor. (C.R.E. (I.B.) 3587/49. Ten/224.)* 28th March. Public lighting material. (C.R.E. (I.B.) 3586/49. Ten/220.)* 29th March. Reflectors, condensers and lamps. (C.R.E. (I.B.) 3710/49. Ten/218.)*

*** Specifications may be inspected at the Commercial Relations and Exports Department, Thames House North, Millbank, S.W.1.**

Orders Placed

Australia.—Sydney County Council. Metal-clad switchgear for substations to Spec. 1084:—A. Reyrolle (£29,231); A.G.E. Pty. (£17,601); English Electric Co. (£10,370); Westinghouse Rosebery (£24,137). Spec. 1112:—Section "A" Westinghouse Rosebery (£24,746); Section "B" A.G.E. Pty. (£11,874); Section "C" Wilson Elec. Transformer Co. (£18,536); English Elec. Co. (£30,707); A.G.E. Pty. (£13,133 and £55,222); A. Reyrolle & Co. (£13,555).

Newcastle-on-Tyne.—City Council. Alterations and additions to electric heating and lighting installations at the Laing Art Gallery (£153).—R. H. Patterson.

Installation of transmitter set in the ambulance station and receiving sets in six ambulances (£995).—Pye Radio.

Northumberland.—County Council. Installation of passenger lifts, Tyne tunnel (£4,942).—Marryat & Scott.

Electrical installation at Cramlington Infant Welfare Centre (£104), and installation of loud-speaker equipment at Monkseaton County Primary School (£177).—Devereux Moodie & Co.

Contracts in Prospect

Particulars of new works and building schemes for the use of electrical installation contractors and traders. Publication in this section is no guarantee that electrical work is definitely included. Alleged inaccuracies should be reported to the Editors.

Bath.—Junior and infants' school, Fosseway; E. Tew & Oliver, architects, 7, Northumberland Buildings.

Birkenhead.—Shops and flats, Woodchurch estate, for T.C.; H. J. Rowse, architect, Martins Bank Buildings, Liverpool.

Bridgwater.—Houses (50), Hillborne's site; borough engineer.

Brierley Hill.—Civic restaurant, rear of The Elms, for U.D.C.; Jennings, Homer & Lynch, architects, 3, Church Street.

Cambridge.—East Anglia regional college, Trumpington Road; county architect, Cambridge.

Carlisle.—Electrical installations in 44 houses at Harraby for the City Council; city engineer, 18, Fisher Street, Carlisle.

Carmarthen.—Houses (76) on five sites; G. G. Thomas, R.D.C. surveyor, Spilman Street.

Chesterfield.—Houses (34) for R.D.C.; surveyor, Saltergate.

Cockfosters.—Shops and flats, Oakwood Parade, Westpole Avenue; Co-operative Wholesale Society, Ltd., 99, Leman Street, E.1.

Coventry.—Home for aged persons, Broad Lane (£23,000); D. E. E. Gibson, city architect, 1a, Warwick Row.

Completion of Coventry and Warwickshire Hospital, Stoney Stanton Road, for Regional Hospitals Board; W. S. Hattrell & Partners, architects, 1, Queen's Road.

Crewe.—Houses (220), Easiform type, for T.C.; John Laing & Son, Ltd., builders, Dalston Road, Carlisle.

Dagenham.—Civic restaurant, Goresbrook; borough engineer.

Darlington.—Girls' high school, Hummersknott; borough architect.

Devon.—Primary school, Watcombe, Torquay; county architect, 97, Heavitree Road, Exeter.

Durham.—Technical college, Stockton (£170,000); county architect, Court Lane, Durham.

Hotel, Sherburn Road; Steel, Coulson & Co., Ltd., brewers, Edinburgh.

Felling (Co. Durham).—Works additions at Pelaw for R. Bowron & Co., Ltd.; Spence & Price, architects, St. Mary's Place, Newcastle-on-Tyne.

Gateshead.—Ambulance depot for the T.C. (£15,000); chief architect.

Factory for Leverton & Co. on the Teams Valley Trading Estate; Arthur & Kirkup, Swinburne Street.

Glasgow.—Houses, Foamslag type (192) and Blackburn type (600); city housing architect.

Godalming.—Houses (60), Aarons estate; borough engineer.

Gosforth.—Houses for U.D.C.: M. J. Liddell & Son, Hunters Road, Gosforth (24 houses); and Cunningham & Forster, Kenton Lane, Gosforth (12).

Grangemouth.—Houses (150) for T.C.; Wilson & Wilson, architects, 39, Vicar Street, Falkirk.

Hatfield.—Technical college (£732,410) for Herts C.C.; Easton & Robertson, architects, 54, Bedford Square, W.C.1.

Hendon.—Sixteen blocks of flats, Station Road estate; A. O. Knight, borough engineer.

Hereford.—Temporary college, Newtown Road (£25,000); county architect, Hereford.

Hornchurch.—Secondary school, Essex E.C.; Tooley & Foster, architects, Buckhurst Hill.

Hull.—Houses (56), Lodge Street; city architect.

Factory, Chamberlain Road; Cement & Steel, Ltd., 30a, Doyle Road, London, S.E.25.

Ilford.—Block of flats, Little Gearies site; borough engineer.

Houses and maisonettes (112), Claybury Park estate; New Ideal Homesteads, Ltd., Mead House, South Street, Epsom.

Factory, Khartoum Road; J. F. J. Brooksbank, 33, Eastern Road, Romford.

Leamington Spa.—Extensions to works; Lockheed Hydraulic Brake Co., Ltd., Tachbrook Road.

Houses (50), in two contracts, Kingsway estate; H. Fedeski, director of housing, 7, Regent Grove.

Liverpool.—Houses (160), Chelwood Avenue; Unit Construction Co., Ltd., builders, Bentham Drive.

Branch library, Brows Lane, for Lancashire Education Committee; G. Noel Hill, county architect, Preston.

Infants' and junior school, Aintree (£74,947); W. A. Gale, Ltd., builders, Linacre Lane, Bootle.

Rebuilding office block for Liverpool Exchange Co., Ltd. (£400,000); Humphreys, Ltd., builders, Knightsbridge, London, S.W.7.

Flats (40) and offices, Fontenoy Street; city engineer, Municipal Buildings, Dale Street.

London.—Medical school, Vauxhall Bridge Road; Regional Hospital Board, 11a, Portland Place, W.1.

CITY.—Reinstatement of Guildhall for Corporation of London; Sir Giles Gilbert Scott, R.A., 3, Field Court, Gray's Inn, W.C.1.

MARYLEBONE.—Offices, Clipstone Street and Hanson Street; Brixton Development Co., Ltd., 88, Hatton Garden, E.C.1.

HAMPSTEAD.—Flats, Broadhurst Gardens; R. Nickson, architect, 33, Welbeck Street, W.1.

Neath.—Large extensions to refinery; National Oil Refineries, Ltd., Llandarcy.

Newark.—Permanent dwellings (200), off Winthorpe Road; John H. Clarke, borough engineer, Balderton Gate.

Newcastle (Staffs).—Factory, Lower Milehouse Lane, Newbold, Ltd., opticians; Hulme & Upright, architects, District Bank Chambers, Tunstall, Stoke-on-Trent.

Newcastle-on-Tyne.—Conversion of premises in Hunters Road into clothing factory for Tyne Clothiers Ltd.; J. S. Johnson, architect, 23, Glenthorne Road.

Rebuilding Collingwood Arms Hotel for W.B. Reid & Co., Ltd.; Hetherington & Wilson, architects, County Chambers, Westgate Road.

Northumberland.—Farm institute at Kirkley Hall, Ponteland (£75,000); county architect, County Hall, Newcastle-on-Tyne.

Oldham.—Two-storey flats (52), Limeside estate (£58,303); Geo. Wimpey & Co., Ltd., builders, 629, Eccles New Road, Salford, 5.

Peterborough.—Schools of building, engineering and bakery (first portion of technical college); David Jenkin, architect, 49, Welbeck Street, London, W.1.

Portland.—Houses (100), Verne Common, for T.C.; surveyor.

Prudhoe-on-Tyne.—Houses (20) for U.D.C.; J. Angus, Hanover Square, Newcastle.

Reading.—Factory, laboratories, etc., Basingstoke Road; Hansen's Laboratories, Ltd., Ronson House, Strand, London, W.C.2.

Rochdale.—Public wash-house, Entwisle Road; W. H. G. Mercer, borough surveyor, Town Hall.

Scunthorpe.—Police buildings and court house for Lindsey C.C. (£25,000); R. A. Clark, county architect, County Offices, Newland, Lincoln.

Seaham.—Pithead baths for the Miners' Welfare Commission, London; staff architect.

Sheffield.—Reinstatement of factory, Eyre Street, etc.; Walker & Hall, Ltd., silversmiths and cutlers.

Shipley.—Crematorium, Ban Wood Cemetery, for U.D.C.; engineer and surveyor.

Shrewsbury.—Extensions, Shropshire College of Domestic Science, Radbrook; G. Wimpey & Co., builders, Denham, Uxbridge.

Shropshire.—County primary school, Granville Street, Newport; A. Guy Chant, county architect, 5, Belmont, Shrewsbury.

South Shields.—Prefabricated factory for Lamb's Potato Crisps, Ltd., Sunderland.

Stockton-on-Tees.—Electrical installation and heating for new boys' department at the Grammar School; G. R. Clayton, county architect, Court Lane, Durham City.

Suffolk.—Infants' school, St. Margaret's Road, Lowestoft, and block of classrooms at secondary grammar school; E. J. Symcox, county architect, County Hall, Ipswich.

Tipton.—Large extensions to works; British Rolling Mills, Ltd., Brynmill Steelworks.

Tursdale (Co. Durham).—Pit-head baths; F. Frizzell, Mines Welfare Commission, 42, Portland Street, London.

Tynemouth.—Houses (16), Marden neighbourhood unit; M. J. Liddell & Son, builders, Hunters Road, Gosforth, Newcastle-on-Tyne.

Wallsend-on-Tyne.—Extensions to works of Thermal Syndicate, Neptune Road; L. J. Couves & Partners, Carliol House, Newcastle.

Warrington.—Factory, Liverpool Road; Joseph Crosfield & Sons, Ltd., Bank Quay.

Watford.—Houses (350), Woodside estate; borough engineer.